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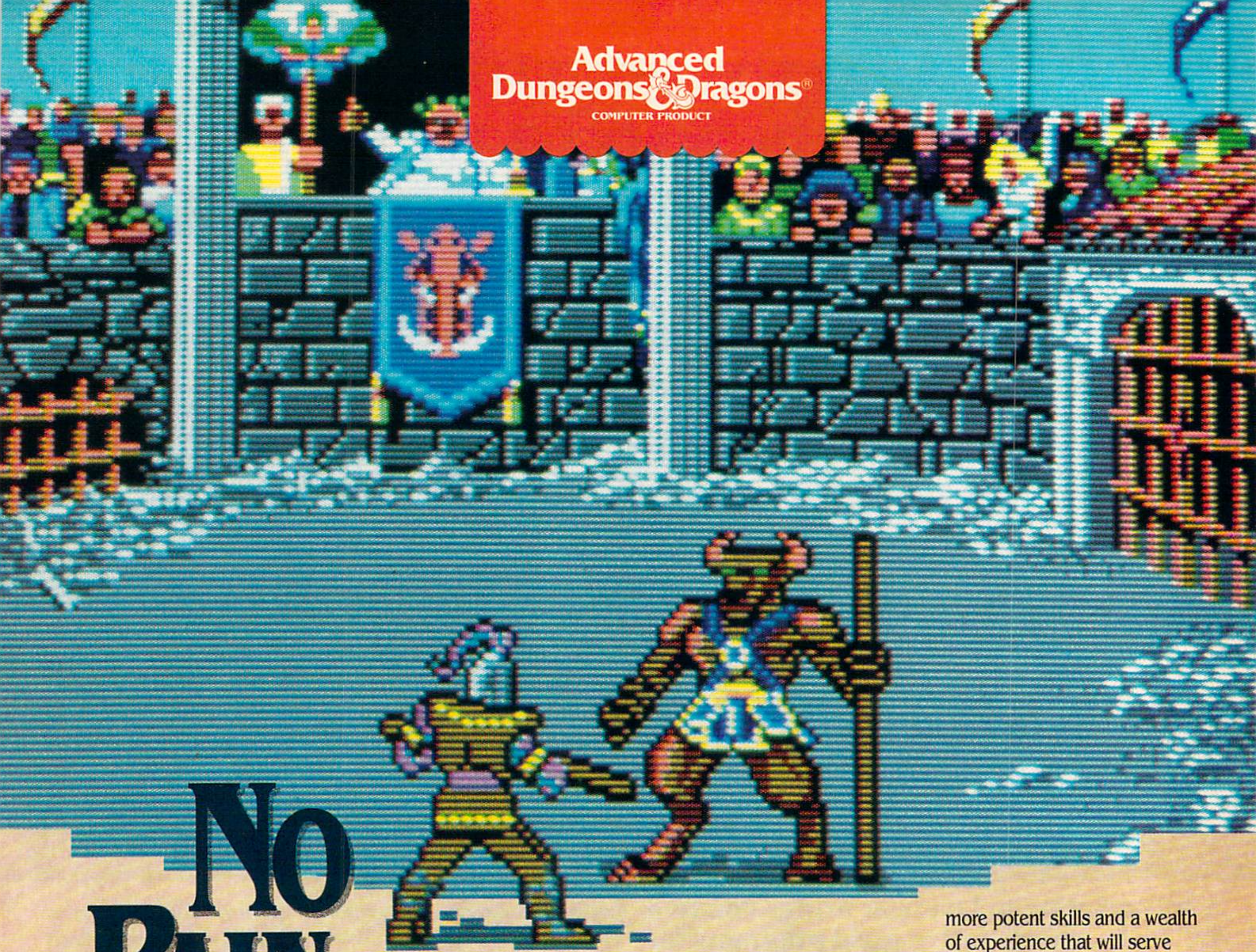
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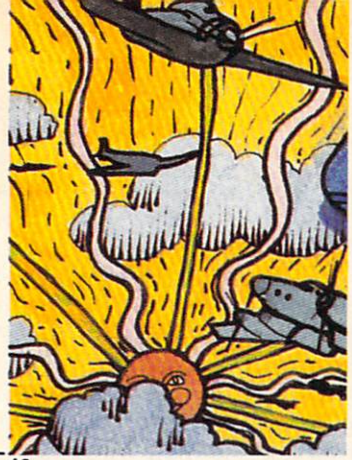
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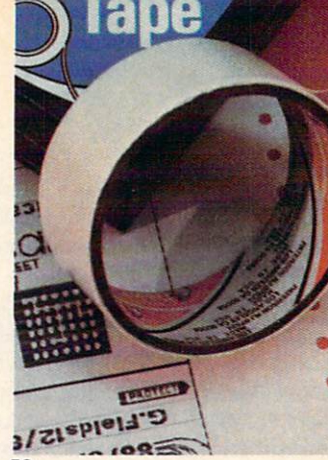
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Commodore
MAGAZINE

MAY 1989, *Volume 10, Number 5*


46



50

FEATURES

COVER STORY

COVER PHOTO: *Charles Bartholomew*
Software: *Operation Wolf* by Taito

REVIEWS

DEPARTMENTS

Of Mice . . .

To the Editor:

Mice or *mouses?* Let us not choose sides and make faces at each other, but rather emulate our computers and be ruled by the logic of the matter.

Are *mouse* (animal) and *mouse* (electronic device) merely spelled alike by coincidence (as some words are), while having completely different origins and meanings? Not at all. The device was named for the animal because they both are small and move about in the same way.

It follows that the noun *mouse* remains a single word having more than one sense, but only one plural form: *mice!*

I believe that settles the matter. Let us turn to more important things.

Lillian Larre
Clio, CA

. . . and Other Beasts

To the Editor:

The "Animal" game by H. Poultonavage in your June 1988 issue is great fun, but I improved the program to make it "smarter." The original program initially asked seemingly arbitrary questions to guess a player's animal by trial and error. I've enclosed a copy of the printout of my changes, which make questions more systematic. (See page 79.)

The first question my version asks is if the animal is a vertebrate. I remember from my grade school biology that this is the most basic division of animals. If the player answers yes, subsequent questions would lead the computer to inquire about a vertebrate's group—insects, arachnids, mollusks, etc.

This scientific approach makes the computer smarter because it asks fewer questions to guess a player's animal. I suspect it also maximizes the number of animals that memory can hold because it reduces chances for errors and duplication.

Sincerely,
Alan L. Hitchcox
Eastlake, OH

Magni Update

To the Editor:

We were happy to see that the Amiga Update "Professional Genlocks for the Amiga" (by Matthew Leeds, March 1989) included a review of the Magni 4004 genlockable encoder.

Matthew Leeds obtained an evaluation unit from us in the early fall of 1988. Since then we have made some minor modifications to respond to our customers.

The installation of the video interface card was described as difficult. This was due to the face plate on the card hitting the metal flange on some Amigas. We have since made the face plate more flexible to ensure a "painless" installation, in which the screw holes match effortlessly.

Regarding the quality of the external video needed for the 4004 to lock appropriately, we have been able to widen our sync lock loop response and increase the video input clamp range providing greater compatibility with lower quality video signals. Though, of course, the 4004 is designed primarily for high-end applications.

A few other corrections: the Magni *will* allow video to pass through without adding graphics, and the recently released 4004S model offers S-VHS support with Y/C outputs for Amiga graphics.

With respect to the unit being "marginally out of adjustment for gain," we'd like to stress that our testing procedure includes precise gain adjustments. Each Magni genlockable encoder is tested and adjusted against international standards, to the same quality we demand of our test and measurement products.

Magni Systems is a video test and measurement equipment manufacturer, with a reputation for innovative, high-quality broadcast equipment.

Sincerely,
JoAnn Waddell
Product Marketing Manager
Magni Systems, Inc.

128 Challenge

To the Editor:

I would like to commend Free Spirit Software on a job well done. They are the first company to come out with productivity software supporting the Commodore 128's 80-column graphics mode in color. And, best of all, the area in which this software lies: desktop publishing. The C128 can now truly compete against those phony 286's and the like. (They also have a paint program, and I congratulate them on that as well.)

Now, I challenge all companies that produce software for Commodore computers to come out with a piece of recreational software using the 128's 80-column display. It should use the fast (2MHz) mode. It could be of any genre of recreational software.

If software comes out supporting the advanced features of the 128, I think more people would be willing to buy them. All right, software publishers, I have dared you to do something that would be trend

Continued on page 79

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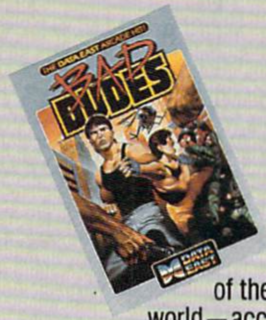
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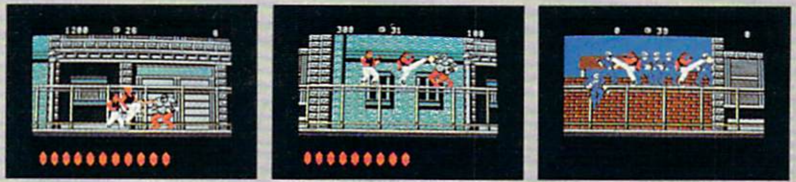
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Commodore Magazine, Volume 10, Number 5, May 1989.

Commodore Magazine is published monthly by Commodore Magazine Inc., 1200 Wilson Drive, West Chester, PA 19380. U.S.A. U.S. subscriber rate is $35.40 per year; Canadian subscriber rate is $45.40 per year; Overseas subscriber rate is $65.00 per year. Questions concerning subscription should be directed to Commodore Magazine Subscription Department, Box 651, Holmes, Pennsylvania 19043. Phone (800) 345-8112. In Canada (215) 532-8687.







Striker and Blade. The Bad Dudes. Facing some of the nastiest ninjas in the known world—accompanied by a gang of fire-spitting thugs and their cohorts, mad dogs who are intent on serious crime. This crowd of malcontents has somehow gotten its ugly mitts on the president of the United States. And what they plan to do with him isn't pretty.

What Striker and Blade have to do isn't any picnic either. But someone's got to do it, right? What better time for you to start dishing out the ***BAD DUDES'*** own version of the criminal justice system? The action is top-notch. The graphics, phenomenal.

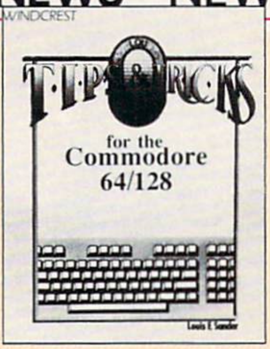
BAD DUDES from Data East. Mr. President, help is on the way.

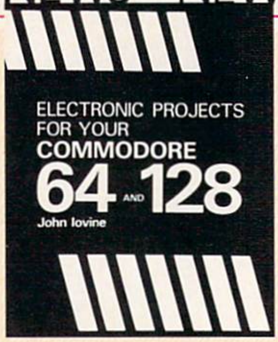
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Screens shown are from the IBM version. Other computer versions may vary.

TAB Publishes *Commodore Magazine* Authors





TAB Books is releasing new books from two of *Commodore Magazine's* most popular columnists. **Lou Sander's Tips and Tricks for Commodore Computers** packs 500 of his best tips into a 352-page volume. Lou's user-tested pointers cover every aspect of computing for *all* Commodore computers. **Lou Sander's Tips and Tricks** is priced at $19.95 (paperback) or $28.95 (hardbound).

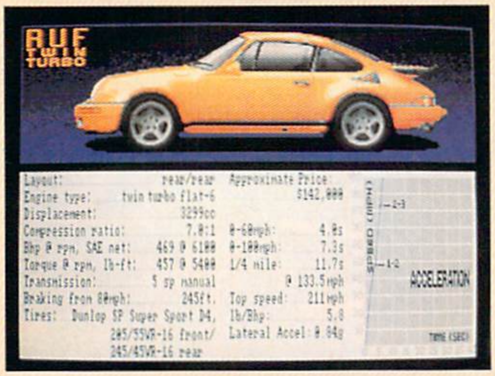
TAB is also publishing John Iovine's **Electronic Projects for Your Commodore 64 and 128**. The book's 11 inexpensive projects include an appliance controller, speech synthesizer, gas sensor and alarm, and a lie detector. The 176-page book sells for $14.95 (paperback) or $23.95 (hardbound). For more information on these titles contact: TAB Books, Blue Ridge Summit, PA 17294-0850 or call (800) 822-8158.

World of Commodore LA

Here's a reminder for west coast Commodore enthusiasts: World of Commodore is coming to Los Angeles this month. From May 19–21, the Los Angeles Convention Center will house the popular computer show that offers something for everyone. "We're anticipating a great success in LA because it's the biggest single market in the U.S. for Commodore and Amiga products," says Gordon Hunter, president of the Hunter Group which organizes The World of Commodore in association with Commodore Business Machines. Admission to the show is $10 for adults, $8 for students and seniors (admission price includes seminars). For more information on WOC, call (416) 595-5906.

The Duel: Test Drive II

Accolade has followed up their best-selling *Test Drive* with **The Duel: Test Drive II** and two accessory disks for the Commodore 64 and Amiga. **Test Drive II** pits the Ferrari F40 against the Porsche 959. **The Supercars** offers five of the fastest production cars ever built, and **California Challenge** will take drivers on a six-leg road race along the California coast. **Test Drive II** retails for $44.95 on the Amiga and $29.95 on the Commodore 64. Accessory disks are available for $19.95 each on the Amiga and $14.95 each on the 64. For details contact: Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. Or call: (408) 985-1700.





Magni 4004S

Magni Systems, best known for providing true broadcast standard video output from the Amiga, now offers support for S-VHS and similar Y/C-based systems. The **Magni 4004S** Genlockable Video Graphics Encoder maintains all features found in the Magni 4004 (internal installation and extensive effects under software control) including the price ($1695). For further information contact: Magni Systems, Inc., 9500 SW Gemini Dr., Beaverton, OR 97005. Phone: (800) 237-5964 or (503) 626-8400.

Inkwell Amiga Light Pen

Inkwell Systems will release a new **Amiga Light Pen** that will be compatible with Electronic Arts' soon-to-be-released *DeluxePaint III*. Inkwell and Electronic Arts worked together to solve the problems that kept *DeluxePaint II* from being completely compatible with Inkwell's **Amiga Light Pen.** The **Amiga Light Pen** also works with most other popular Amiga graphics programs. For more information contact Inkwell Systems at their new address: 1050-R Pioneer Way, El Cajon, CA 92020. Phone: (619) 440-7666.

Designer Database

Software Visions has released the first two **Designer Database Series** disks for use with their *Microfiche Filer* and *Microfiche Filer Plus* on the Amiga. **Home I** includes videotape, audio recording, stamp and recipe catalogues; a home budget and a personal

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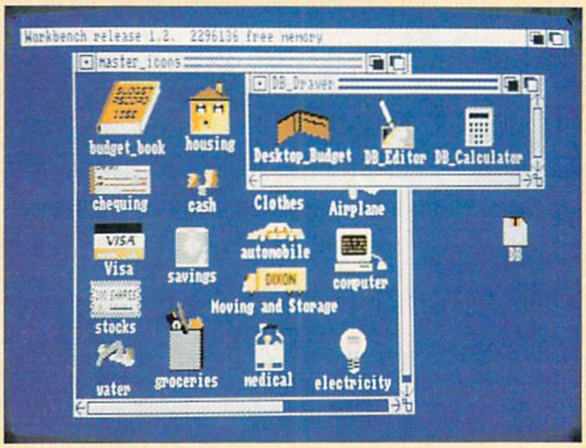
1989 BBS Bible

Bubeck Publishing has released the **1989 BBS Bible,** a listing of almost 5000 public computer bulletin board services in the U.S. The book lists BBS's by over 130 separate interest groups. "Being able to

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Gold Disk Releases

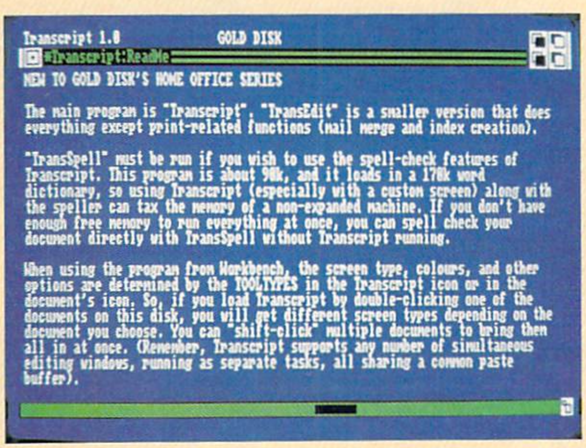
Gold Disk has released four new Amiga titles. **Desktop Budget,** a personal finance management program, is the first release in a new Home Office Series. The icon-based program has a suggested retail price of $69.95.



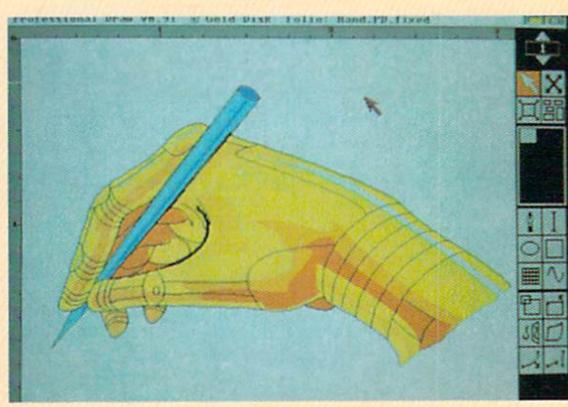
Gold Disk has developed a hardware/software interface for the Cannon IX12 scanner. The scanner allows users to save black and white IFF files at up to 300 dots per inch. The scanner with interface carries a suggested retail price of $1095.



Transcript is a new text editor/word processor in the Home Office Series "designed for performance, not gimmicks." Gold Disk boasts that **Transcript** is the fastest Amiga word processor ever developed. The program, which retails for $69.95, has a 90,000-word spell checker and will retain *Professional Page* style commands.



Professional Draw is Gold Disk's new structured drawing program for the Amiga. The program's built-in color separator will allow users to prepare color graphics for mechanical or process color offset printing. Retail price is $199.95.



For more information on these new products, contact: Gold Disk, P.O. Box 789, Streetsville, Mississauga, Ontario, Canada L5M 2C2. Phone: (416) 828-0913.

find the service you want makes millions of modem-equipped personal computers more valuable,'' says author Thomas W. Bubeck. The **1989 BBS Bible** is available for $24.99 (plus $3 S/H; PA residents add 6% sales tax) from: Bubeck Publishing, P.O. Box 104, Collegeville, PA 19426. Phone: (215) 287-6356.

Powerplay Hockey

Electronic Arts has announced a new ice hockey simulation for the Commodore 64. **Powerplay Hockey: USA vs. USSR** features three levels of play and one-on-one or five-on-five play options. The game includes penalties, slap shots, body checks and variable period lengths. Suggested retail price for **Powerplay Hockey** is $24.95. For details contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Phone: (415) 571-7171.



Willow

Mindscape has released **Willow,** a fantasy-adventure for the Commodore 64 and Amiga based on the movie of the same name. The game follows the storyline of the movie—three unlikely heroes fight to uphold all that is good in the world. **Willow** also features seven different arcade sequences. Suggested retail price is $29.95 for the Commodore 64 version and $39.95 for the Amiga. For further information contact: Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. Phone: (312) 480-7667.

International Soccer

International Soccer from MicroDeal lets you control just about every aspect of the game—from the coaching to the jersey color to the weather—on your Amiga. With the optional joystick adapter ($14.95) the game allows up to four players (two on two) to go against each other or up to three against the computer. **International Soccer** sells for $39.95. For details contact: MicroDeal, 576 S. Telegraph, Pontiac, MI 48053. Phone: (313) 334-8729.

Data East Supports Amiga

Data East, a leading manufacturer of coin-op and personal computer games, has announced the release of their first four Amiga titles: **Platoon, Guerrilla War, Bad Dudes** and **Robocop.** The announced titles will be available during the first half of this year at a retail price of $44.95 each. (The first two titles mentioned are also available for the Commodore 64 for $29.95 each.) For further details contact: Data East USA, Inc., 470 Needles Dr., San Jose, CA 95112. Or call: (408) 286-2071.

Lancelot and Time and Magik

Datasoft has released two new interactive fiction titles to be distributed by Electronic Arts. **Lancelot** is a three-part fantasy adventure for the Commodore 64 that takes you back to Camelot for the founding of the Round Table, the quest for the Holy Grail and the romancing of Guinevere. **Lancelot** retails for $29.95.

Time and Magik for the Commodore 64 and Amiga is a time-travel adventure that provides three separate scenarios to play. A multiple undo option allows the player to backtrack several steps. Both new titles feature digitized graphics and 60,000 words of text each. **Time and Magik** for the 64 carries a suggested retail price of $29.95; the Amiga version sells for $39.95.

For details contact: contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call: (415) 571-7171.

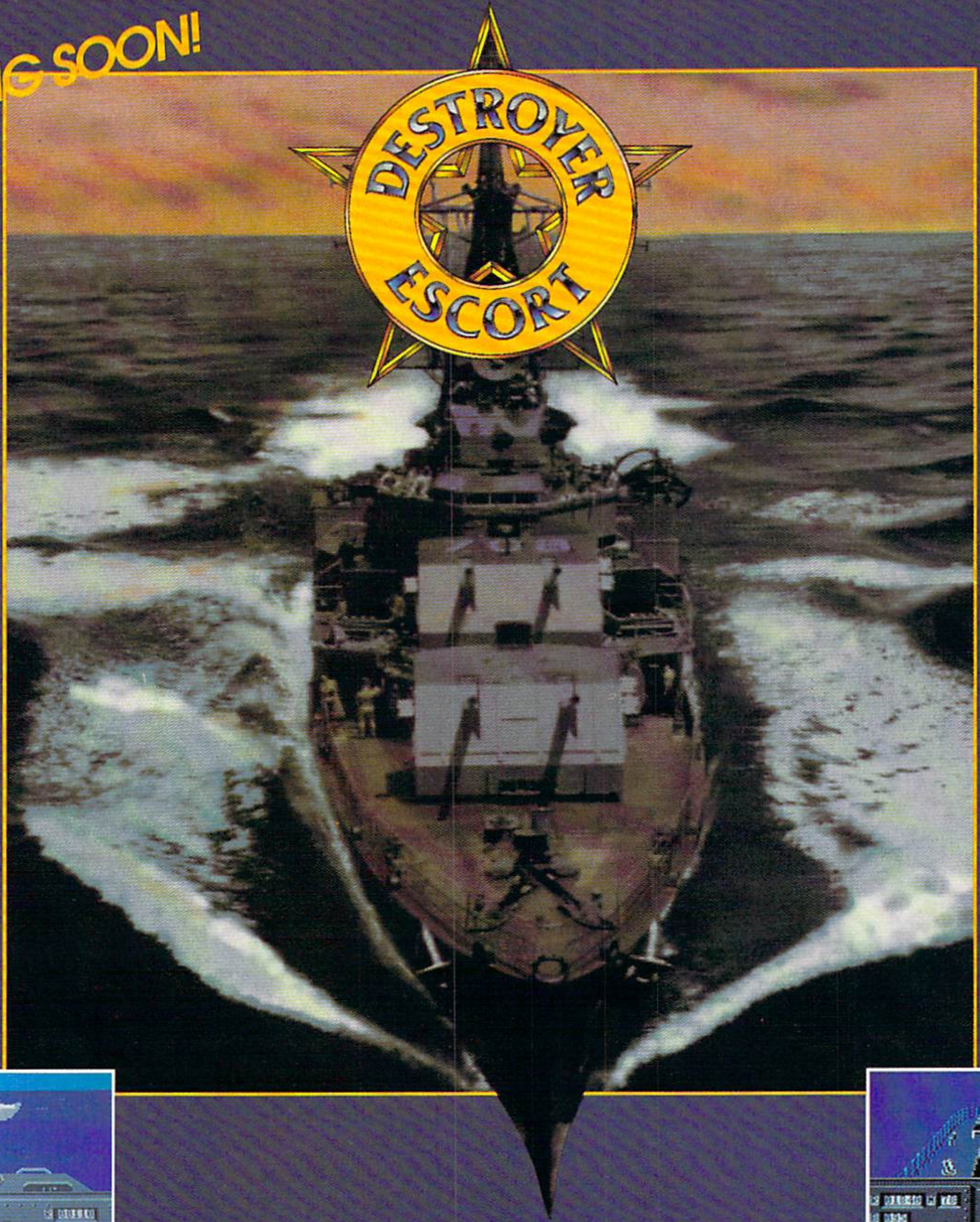
Epyx Hints

Even advanced game players can use a little help sometimes. That's why Epyx has released **The Masters Collection Advanced Hint Book,** a collection of clues, maps and interviews with game developers that should help you past the rough spots in four Masters Collection titles. Included are hints for these Commodore 64 releases: *Space Station Oblivion, Sub Battle Simulator, The Legend of Blacksilver,* and *L.A. Crackdown.* The 46-page book sells for $7.99. For details contact: Epyx, Inc., 600 Galveston Dr., P.O. Box 8020, Redwood City, CA 94063. Phone: (415) 368-3200.

Apache Technologies

Some former Aegis employees have formed Apache Technologies to market Amiga programs developed by smaller publishers. Affiliated companies and titles include Incognito *(Targis, Snake Pit);* DesignLab *(Fine Print);* Digital Concepts *(Torch 2081, Professional Lottery System, Island of Lost Hope);* Haitex Resources (X-Specs 3D, *Haicalc, ADrum, X-CAD, Acquisition, Amiterm);* Starvision *(StarSound);* Octree Software *(Calagary).* In addition, Apache will market Silent Software's impending releases. For more information contact: Apache Technologies, 5341 Derry Ave., Suite C, Agoura Hills, CA 91301. Phone: (818) 991-2244.

COMING SOON!







C-64/128 Screens Shown

Guiding a Destroyer Escort through hostile waters during World War II was no glamour detail. Despite its formidable array of weaponry, the escort ship was always vulnerable to attack — from airplanes, surface ships, and submarines — and only the captain's resourcefulness, and the accuracy of his gunners, could keep the convoy on course and out of harm's way.

- Six different routes to navigate — each with different dangers, each requiring different strategies—between the United States, Great Britain, Murmansk and Gibraltar!
- Three variable levels of difficulty keep the game constantly challenging for any player!
- Blast enemies in any direction with torpedoes, anti-aircraft guns, depth charges or a five-inch gun!
- Seven different, detailed battle scenes, from the navigation center to damage reports!
- Many thrilling hours of exciting arcade game action!

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Can't find DESTROYER ESCORT? Call 1-800-876-1151 weekdays 8am to 5pm EST and order by MC/VISA; or mail check or money order for $39.95 for C-64/128 version; plus $2.50 for shipping and handling U.S. funds only. MD residents add 5% sales tax. $5.00 for international order. Allow 1-3 weeks for U.S. delivery. Coming soon for IBM/PC and compatibles.

Lou Sander's Tips & Tricks

Compiled by Louis F. Sander

This month we feature our annual guide to writing and submitting tips, plus several hints for use with commercial programs. (As always, game tips will be found in the "Gold Mine"). There's a useful series on special keys, two exciting games and the usual smattering of tips for every interest.

Trick Writer's Guide

Every month, readers submit hundreds of items to this column, but we only have space for about twenty. Getting your own item into print takes a combination of knowledge, skill and good luck, but a lot of people have that combination. If you follow these suggestions when submitting your tricks, you'll increase your chances for success:

- I seek hardware and programming hints, short programs or subroutines, ideas for a better computer room, and similar items of value to Commodore computerists. If you read "Tips and Tricks" regularly, you know just what I look for.
- Tricks are selected on the basis of usefulness, originality and ease of implementation by readers.
- Items must be brief. Try to fit your ideas onto a single sheet at most, and half a sheet if possible. The best contributors are masters of condensation and brevity, and they seldom send anything longer than a page and a half.
- Use standard 8½ × 11-inch paper for your submissions. Don't use odd sizes, and don't use sheets from a spiral notebook. Both are hard to handle and easy to lose.
- Put each trick on a separate piece of paper, and put your name and address on each sheet. That will avoid the heartbreak of "Address Unknown."
- I pay closest attention to tips that come double-spaced from your printer or typewriter. You can help yourself by sending your material in that form.
- If you must write your tips by hand, pay extra attention to neatness.
- Program listings should fit onto a single 40-column screen if possible. All but the shortest programs should be submitted in disk form as well as on a printed listing. Sorry, but I can't accept programs that are submitted as handwritten listings.
- Due to the large volume of mail, I can't acknowledge receipt of your material, and I can't return rejected material to you. Neither can I return your disks. (I give the extras to a needy user group.)
- If your trick is accepted, you'll get a check when it appears in print, which is never less than 90 days from the time I receive it. I typically pay $10 for tricks, but the best ones get up to $50. The main benefit of having a trick accepted is not the money you get, but the satisfaction of knowing that your ideas are helpful to others. It's also a thrill to see your name in *Commodore Magazine,* which is avidly read by people all over the world.
- To submit your own items for consideration, put them all into one envelope and mail them to:

Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

Extra Programs on Commercial Disks: I always look closely at the directory of any commercial disk that comes into my possession. Often I find useful programs or files that aren't mentioned in the documentation.

On the Q-Link disk, for example, there's the Sprint sequential file reader. It's not a bad idea to print the directory out on your printer. If you keep the printout in the envelope with the disk, you'll have it handy for future reference. Since the printout sheet will include a lot of white space, it's also a useful place to keep notes about the program.

Lewis Hunnicutt
Royse City, TX

geoWrite Workshop 128: Here are two useful tips:

First, the geoLaser fonts that come with the *Workshop* are quite usable on a normal dot matrix printer. In fact, the ones that are the same as the normal GEOS fonts actually have a wider range of point sizes. One example is LW Roma, which is essentially the same font as Roma. If you want you can rename the geoLaser fonts, so you won't have to decipher the LW Cal and other similar names.

Second, by following these steps, you can use the Paint Overlay driver to overlay two *geoPaint* files:

1. Rename one *geoPaint* file with the name OVERLAY.
2. Select Paint Overlay as your printer driver and print out the second file you are interested in.
3. When GEOS is finished writing to the disk, your second file should be Overlayed on top of the first one.

This simple procedure can produce some very professional results.

Sean Burke
Burton, OH

geoWrite: If you use *geoWrite* with an MPS-801 printer, the first line will usually print over itself. To prevent this, leave the first line blank. Start your actual writing on the second line.
Nathaniel Durham
Seagrove, NC

Capturing Hi-res Screens as *Doodle* Files: It's fun to use *Doodle* to display and modify high-resolution graphics screens produced by other programs. I've done it with screens from *The Bard's Tale I–III*, the gas station scenes from *Test Drive*, and the title screens from *The Three Stooges*.

If you have a 128, you can do it by following my instructions. If you have a 64, you'll also need a reset button and a cartridge that includes a machine-language monitor. Here's what to do:

On a 128, initialize your machine, go to 64 mode and load the program that contains the desired high-resolution graphic. As soon as the graphic has loaded, simultaneously press the reset button and the RUN/STOP key. This will activate the machine-language monitor. Use the monitor to save memory locations $1C00–$3FFF, using a filename that starts with the letters DD. For example:

S"DDBARDSCENE",8 1C00 3FFF

The DD prefix actually makes the file into a *Doodle* file!

Now go to 64 mode and load *Doodle*. Load your graphic, fix up the colors, and you're in business.

On a 64, go through the same procedure, but instead of pressing the reset button and RUN/STOP, press the reset button then enter the monitor. The other steps remain the same.
Ricky Yu
San Jose, Costa Rica

Labels from *Print Shop* or *Printmaster*: You can use these commercial programs to make high-quality labels for mailing or other purposes. You have to print them one at a time, but you can include fancy fonts and graphics.

First load some continuous labels into your printer, centering them on the platen. Using the letterhead option of *Print Shop* or *Printmaster*, create the design you'll later print on the label. Then print it out and admire your handiwork.

It may take a few tries to get the spacing and layout correct, but the time you spend will be worth it.
Peter Lin
Irvine, CA

All about the SHIFT Keys: The use of the SHIFT and SHIFT LOCK keys, while obvious to the expert, can be confusing or mysterious to beginners. This tip will clear up the mystery.

First, look at the top row of keys on your keyboard—the row that has the numbers 1 through 0. Observe that many of the keycaps also have a second label above the number label. The 1 has an exclamation point and the 4 has a dollar sign, for example.

Almost everyone knows that those second labels apply to the key's function when it's shifted, but many people don't know exactly how the SHIFT key works. Actually, it's simple: when the SHIFT key is down, the other keys produce their "shifted" characters. When the SHIFT key is *not* down, the other keys produce their "unshifted" characters.

The SHIFT key normally has no effect until another key is pressed. The proper way to use a SHIFT key is to depress it, and while it is depressed, press the other key.

There's no reason to press both keys at the same instant, although some beginners try to do it that way. Those same beginners often wonder why the computer isn't doing what they tell it to; usually the answer is that in their effort to press SHIFT and another key simultaneously, they really pressed the other key first.

Because of this chance for error, my advice is to avoid any attempt at pressing the keys simultaneously. Always make a distinct press to the SHIFT key, then press the other key while SHIFT is down.

Now let's get back to key labels and their relationship to the SHIFT keys. When a key has two labels on its top surface, the upper label almost always indicates the result of shifting the key. The keys in the top row are examples of this, as are the slash/question mark and similar keys in the lower rows.

RUN/STOP, INST/DEL and CLR/HOME are other examples. Unshifted, they stop the computer, delete a character, and move the cursor to home, respectively. Shifted, they run a program, insert a character, and clear the screen.

Many alphabetic keys have two graphic characters engraved on their front surface. The graphic on the right will be produced when the key is shifted, provided the keyboard is in graphics mode. (The one on the left is produced by using the COMMODORE key).

The SHIFT LOCK key is nothing more than a push-on, push-off switch. Pushing it once has the effect of permanently depressing the SHIFT key. Pushing it again has the effect of releasing the SHIFT key. If you ever use this key, don't forget that it causes ALL key presses to be shifted, even the RETURN key. Shifted RETURN often has a different effect from unshifted RETURN, and if you aren't aware of it, it might come back to haunt you. In almost every case, the left and right SHIFT keys have identical functions. But the computer always knows which one is being pressed, and occasionally a programmer will take advantage of the difference. So from time to time you may encounter a program that requires you to press the left or right SHIFT key in connection with some operation.
Louis F. Sander
Pittsburgh, PA

All About the COMMODORE, CTRL and ALT keys: Now that you know how the SHIFT keys work, you're ready for these other special purpose keys.

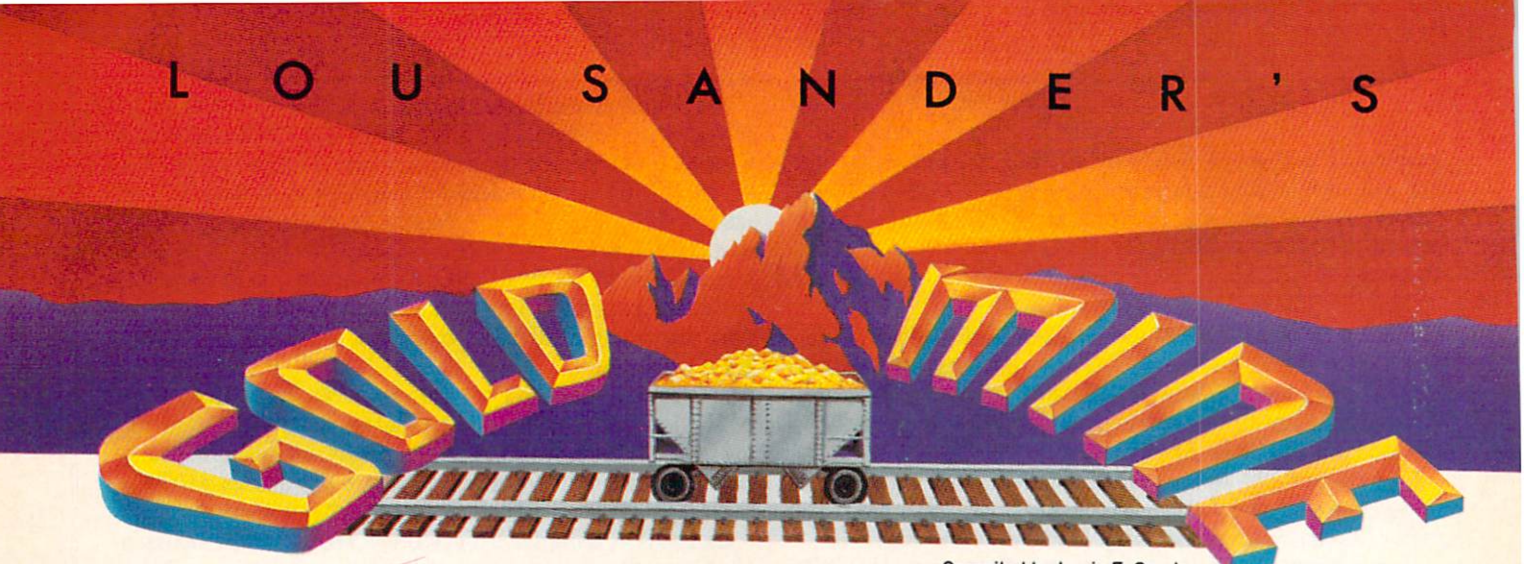
The COMMODORE key is marked with the Commodore logo, and is found at the lower-left corner of the keyboard. The CTRL key (labeled CONTROL on the 128), is at the left end of the row of keys just below the number row. The ALT key, found only on the 128, is in a separate group of keys above the number row.

All three work like the SHIFT keys, in that when they are depressed they change the effect of other keys. Like the SHIFT keys, they should be pressed before the other key, and held down while it is being depressed.

Like all keys, the effects of these three can be controlled by the programmer. Also like all keys, they almost always have certain specific effects.

The COMMODORE key is used primarily with keyboard graphics and with the color keys on the number row. As the SHIFT key produces the graphic character on the right of the key label, the COMMODORE key produces the graphic on the left. Unlike the SHIFT key graphics, the COMMODORE key graphics are produced even when the computer is in upper/lower case mode.

Continued on page 88



Compiled by Louis F. Sander

Good news for all Gold Miners—we've struck a rich new vein of ore! This month, every nugget is from a computer game never before seen on these pages. Some of the games are new, and some of them are old, but none have been featured in this mine until now.

And in this and future months, the lion's share of our tips will be for the games most widely played by our readers. We'll still cover European, Australian and South American software, but we'll emphasize the popular domestics.

If you have a nugget to share with our readers, write it up and send it in. Stake your claim at:

The Gold Mine
P.O. Box 101011
Pittsburgh, PA 15237

Use a separate sheet for each game, and put your name and address on every paper you send us. Neatness counts, and full-size double-spaced printouts are preferred.

If one of your nuggets is printed, you'll get momentary worldwide fame, the knowledge that Gold Mine Rules, and a nice little $5 grubstake.

Aaargh: Defeating your opponent in one-on-one battles (whether you play the Ogre or the Lizard) is no contest. As soon as the sequence begins, keep your fire button depressed and continually throw straight punches at your opponent, waiting for him to walk into them. It takes four punches to defeat the Lizard, but only three to defeat the Ogre.
Rob Thomas
Forest Hills, NY

Ace 2: When the title screen is being displayed, press the "C" key to enter training mode. This will make the plane on top "immortal," allowing you to get a feel for the game without having the computer blow you out of the sky. Once you're familiar with the game, training mode is useful for improving your aim and other techniques.

If the other player is about to get a missile lock on you, drop your altitude to 800–1300 feet. About a second after the missile is fired, point the nose of your plane straight upward. Keep going until the missile warning siren has stopped.
Rick Buongiovanni
Manassas, VA

B.C. II, Grog's Revenge: Notice the tunnel on the far side of the first mountain. It has no spikes on it, and Grog cannot get you at either of the openings. Keep going through this tunnel until you have enough to cross the bridge, or at least until there are no clams left in the tunnel.
Dan Ledger
Strafford, PA

Boot Camp: In the Arm Wrestling event, you can win in about two seconds by getting a quick start, even before the match "officially" begins.

When fighting Sgt. Tailkicker, give him a diagonal kick then jump over him. Repeat the process until you win. On the Terrorist Mission, you can kick the knives they throw at you.
Tom Mulcahy
Pennellville, NY

Classic Concentration: When you get on the Championship List, play the game. If you don't solve the puzzle, look at the answer then shut off your computer. When you run the game again, you'll still be on the Championship List!
Ron Solenske
Rahway, NJ

Contra: When you get to the screen where you climb up the mountain, shoot the first diamond on the other side, then jump across and get it. This diamond is a barrier shield, and if you pick it up and climb fast to the top of the screen, you'll arrive unharmed.

On the last screen, just before the giant snake, a bouncing ball will come across the top of the screen. This is also a barrier shield. Shoot it and get it, then run as fast as you can into the body of the snake. You'll arrive safely at its heart. Shoot the heart as fast as you can; if you're lucky, you'll destroy the creature and complete the mission.
John Ericson
Newington, CT

Deadline: If you want some questions answered, but nobody will speak to you, try asking the Dead Body. It speaks, and even dodges when you try to kill it.
Mike McDermott
Tucson, AZ

Deadline: Try rubbing the pad with another object, then carefully examine it.
Alex May
Brooklyn, NY

EOS: Earth Orbit Stations: Here are a few tricks to make EOS more enjoyable. Never select the other players to be computer controlled, since the computer only makes module stations. Also, it takes several minutes between turns to load in the computer's players.

If you need some extra money, steal some. Select Players from the Tools menu, then select a different player or make a new one. Selecting a computer player will not work. Now select Goodies and Trade Cash. Hold down the "G" until the amount stops growing. If the Cash on Hand amount is uneven, press the fire button (or RETURN key) until the amount stops growing. Select Trade Now and your player number. Now select Players and your own player. You now have all the money that the other player had! This is cheating if you play against another person, but it's fair if you're playing alone.

Remember that the "G" key is a fast way to select things. In the bank, you can use the "G" key to increase amounts by ten credits. When changing the amount you charge for module use, use "G" to change it by one credit. When converting all modules of one type to research or commerce, select the type they'll be converted to, then press "G."

The instruction book is vague on selecting advanced stations; maybe this advice will help. When you have a free form station with no modules attached, select Stations and that free form station. Now select Tools and the icon with the station number next to it. You now have some information about that station.

Select New Class and then Advanced, and you'll get a list of all possible advanced stations. Select one and wait for the picture to load in. Build the station by delivering the cargo modules it requires. See Appendix B in the manual for the details.
Chris Horning
Cuyahoga Falls, OH

Enchanter: Sleep in the four-poster bed, then examine the bedpost when you get up. To open the jewel box, first drop all your items outside the gallery. Find the Ozmos spell inside the gallery, then go out of the gallery and make your way out of the temple. Drop all your inventory, cast the spell on yourself and go back inside.
Eric Turnbow
Decatur, GA

Fire Power: In one- or two-player mode, use the radar window to your advantage by seeking the enemy flag (the faint blinking dot) and helicopters (incoming solid dots). Before the enemy helicopters reach you, set your tank to the 315-degree marker or the northwest position. Once in this position, keep firing to rack up a high score.

To be really mean in two-player mode, lay your mines by the enemy tank hangar. The other player will have to go over them to get out. Also lay mines by your flag.
John E. Kellett
Saginaw, MI

Galaxian: In the bottom-right corner, nothing can blow you up except a head or a laser.
Andrew Fairley
Seattle, WA

The Games: Winter Edition: You can skip the Opening and Closing Ceremonies by pressing the fire button. You can view each screen by pressing your joystick right. You can fast forward an Awards Ceremony by pressing the fire button.

In Cross-Country Skiing, start by first pushing left, then quickly right. Keep this rhythm as much as possible. I hold the fire button down throughout the race, so I double-pole downhills and step-up uphills.

In choreographing the Figure Skating event, it's easier to place your moves at set time intervals, such as eight seconds. Then just count the intervals in your head while performing. For the double and triple axels, you should leave 15 seconds or so, since these are hard maneuvers to complete. Don't try to put these moves together, as it's nearly impossible to do it successfully.

In the Luge event, the longer your warm-up, the faster your time. At the start, press the fire button as many times as possible to dig in. Right before you reach the gate, press right.

On straightaways, don't move your joystick at all, unless your position is too close to the wall. I've noticed that Track 1 is the fastest. My best time there is 23.32 seconds.

When starting the Ski Jump, hold your joystick up until you launch yourself at the bottom of the ramp. Then push up again to raise your arms, keeping them up until just before your landing sequence. This will give you greater distance and style points.

When you start the Slalom, don't forget to push up first. Also, the closer you round the flags, the faster your time will be. Don't be afraid to brush them, as this means you are as close as possible without crashing.
Chad Rowe
Baden-Soellingan, West Germany

Halley Project: When searching a planet for a landing site, you can conserve fuel by holding still in one place and moving your view around. If you don't find the site the first time, move to the opposite side and do it again.
Benjamin Hardekopf
Camp Lejeune, NC

Hollywood Hijinx: The trick to getting into the house is in the poem and the statue of Buck. You have to twist the statue west, then east, then north until you hear the click. Check the poem at this point, and you'll see that the answer is in plain sight.
Shane D. Dolha
Regina, Saskatchewan
Canada

Ikari Warriors: For unlimited lives in this game, load the program then use your reset button to reset the computer. When you see the Ready prompt, enter these lines:
```
POKE 12012,234 : POKE 12013,234 : POKE 12014,234 POKE
53280,0 SYS 2355
```
Paul Grebenc
St. Catherines, Ontario
Canada

Continued on page 94





Reviewed by Scott A. May

Grand Prix Circuit

Computer: Commodore 64
Publisher: Accolade, Inc.
550 S. Winchester Blvd.
Suite 200
San Jose, CA 95128
Medium: Disk
Price: $29.95

Remember last year's *Test Drive,* a driving simulation that gave new meaning to the phrase "beautiful but dumb"?

Well, now you can forgive and forget. The designers responsible for that software faux pas have found redemption with *Grand Prix Circuit.* Open up to full throttle, 64 drivers, it doesn't get much better than this.

A magnificently-illustrated title screen paves the way to a main menu offering the following choices: practice lap, single race or the Championship Circuit. Races can last from a quick one-lap trial run to a grueling 99-lap endurance test. Five difficulty levels, from beginner to pro, are available. Keep in mind that this setting not only determines your skill level—for steering, shifting, avoiding collisions—but also the driving style and temperament of the "other guy."

Practice mode is great for getting the feel of a particular track or one of the three Formula One racers. Practice laps are always driven on an empty track.

The single race mode consists of a qualifying lap for starting placement, then the actual race against nine other computer-controlled drivers.

All roads lead to the Championship Circuit. Here you must race on eight international tracks, with your cumulative record determining your place in the World Driving Championship. This is the ultimate challenge. Combined with variable skill levels and lap duration, the Championship Circuit never loses its thrill. The eight tracks are both famous and diverse, offering an entertaining variety of course configurations. The easiest tracks for beginners hail from Germany, Great Britain, Italy and Canada. These tracks vary in difficulty, but generally feature long straightaways and wide, gradual corners. The killer tracks—from Japan, Monaco, Brazil and Detroit—boast serpentine mainlines and treacherous hairpin curves.

The eight tracks are both famous and diverse, offering an entertaining variety of course configurations.

After each race a Clip Board screen reveals how well you did against the competition. Information here includes overall time for the race, average speed and Best Lap stats. Each course has its own vanity board (high score table) for saving your feats to disk.

Three high-performance cars are available to drivers. Choose the Ferrari, a V12, five-speed dynamo with excellent handling—great for beginners. Or maybe the Williams, with its V8, six-speed Renault engine—guaranteed to rattle your china on the straightaways. Finally, there's the six-speed McLaren. This monster roars to life with superb breakaway speed, but tends to act a little rough on the curves. For power users only.

The cockpit of your racer features an eye-pleasing mix of practical information and gratuitous graphic embellishments. Essential gauges include tachometer, digital speedometer and damage indicator. Twin rear-view mirrors on each side of the cockpit complete the ensemble.

For beginners, shifting is handled by the computer. At higher skill levels, players assume total control. To shift correctly, glance at the tachometer when you hear the engine whine reach its peak. After gaining experience you can shift on instinct alone. Watch that red line, especially when down-shifting, or you'll blow the engine.

In the upper-left corner of the screen, far above the action, a map shows an overhead view of the track. A small square highlights your position on the track in relation to other racers (shown as smaller dots). The map is quite helpful for anticipating upcoming curves, but can be turned off if desired. A race information box in the upper-right corner displays your lap number, current race position and the elapsed time.

When excessive spin-outs and minor fender benders take their toll on your vehicle—as shown by the damage indicator—head to the pits for a quick fix. Pit stops add a great deal to the game's overall strategy. Unfortunately, they also require lengthy disk access time. Sometimes a wreck can be too severe, taking you and other racers out of the race. Visually exciting, but frustrating.

Joystick control offers tight, yet slightly over-responsive steering control. The steering wheel should center itself following curves, but don't count on it. Prepare to bob and weave like a drunken fool before acquiring the touch.

Surprisingly, keyboard control is quite responsive and in many ways preferred. Commodore 128 owners will delight that the game supports that system's numeric keypad. A helpful hint is to steer with the numeric keypad and accelerate with the cursor keys.

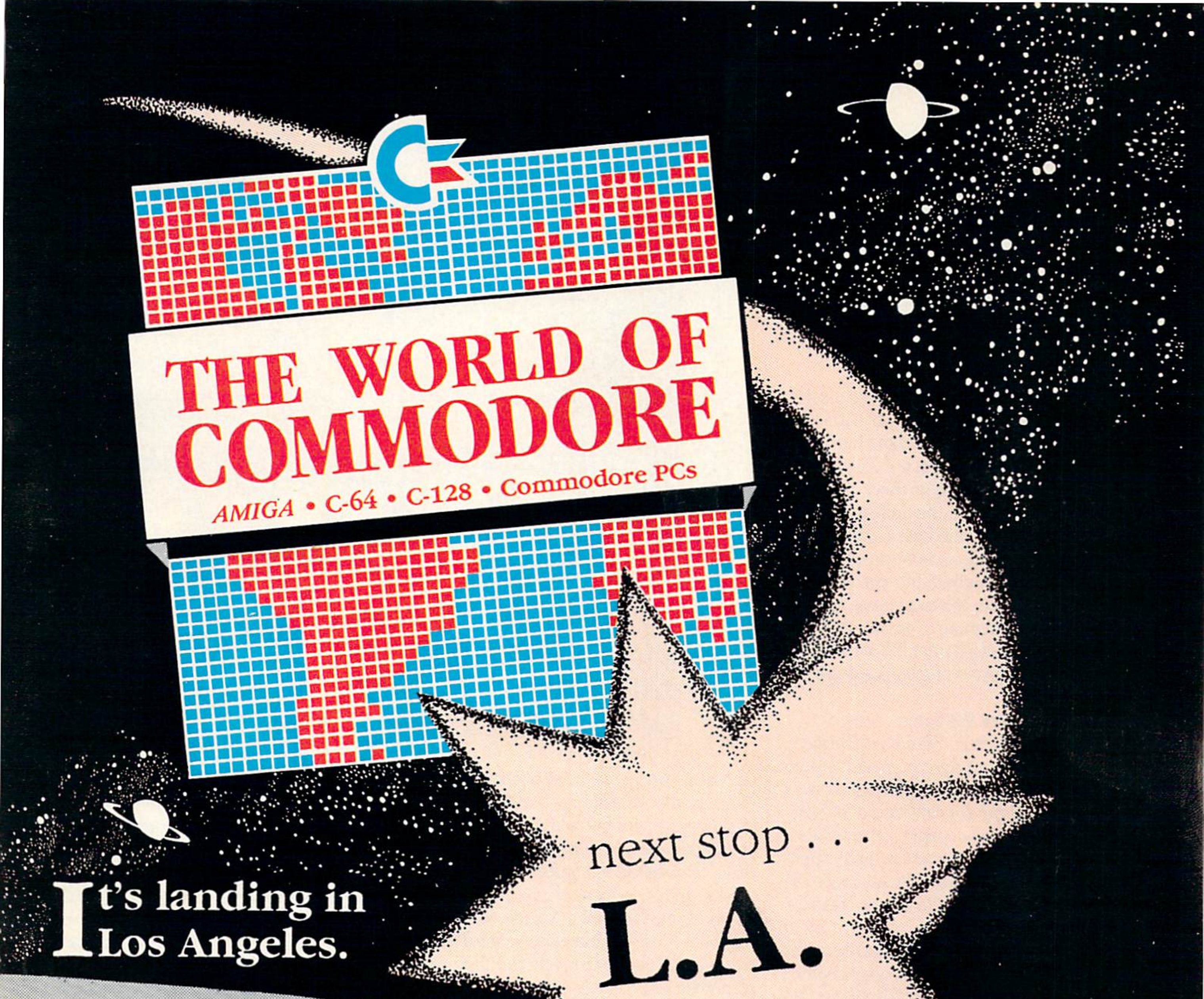
Last, but hardly least, *Grand Prix Circuit* features 3D behind-the-wheel graphics that will take your breath away. Considering memory requirements and speed of animation, the 64's graphics are outstanding—far and away the best of any racing game for this system.

Sometimes the relationship between the foreground animation and scrolling background scenery appears a little shaky, but never enough to detract from the game. Overall, the design work here is stunning.

One of the game's toughest challenges is maneuvering around opponents at high speeds. You must learn to "read" the driving style of the vehicle in front of you and instantly react when it shifts positions. Watch the overhead map for curves and move to the inside lane. When approaching a straightaway, prepare to pull out and punch the throttle.

Another problem area is surviving the curves. Most drivers tend to get carried away and become real speed demons. Don't be afraid to reduce throttle or downshift. In the long run, this takes up much less time than recovering from a spin-out. Again, watch the overhead map for upcoming curves.

Grand Prix Circuit celebrates life in the fast lane with Formula One racing so real, it leaves nothing to the imagination. ■


THE WORLD OF COMMODORE
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Reviewed by Mike Rivers

Take Down

Computer: Commodore 64
Publisher: Gamestar
3885 Bohannon Drive
Menlo Park, CA 94025
Medium: Disk
Price: $32.95

How'd you like to punch some pixels? Did you ever want to spar with some sprites? How 'bout hurtin' some hardware? Well, they can run, but they can't hide, 'cause you'll be right there in the action with *Take Down*, the professional wrestling arcade game from *Gamestar*.

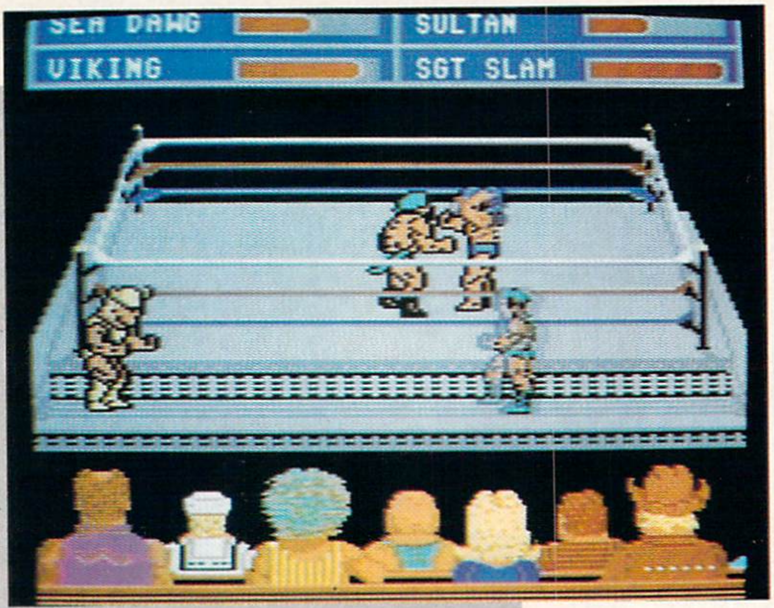
Take Down is a tongue-in-cheek arcade version of a fictionalized pro-wrestling "tag-team" match. Players choose two wrestlers from a group of eight different characters patterned after TV wrestlers—complete with funny names, costumes and bad attitudes.

When you boot the game, you see Bruno "the Enforcer" Squiglioni, former champ and current fight promoter, seated at his desk. (Note the bubbles in the water-cooler and the shadow that passes the door in the hallway outside.) Bruno has been dropped on his head too many times and can't seem to choose wrestlers for the next bout, so you have to choose them for him.

Instructions appear in Bruno's thought balloon for selecting one- or two-player games and individual wrestlers. Four television monitors at the top of the screen display NTSC color bars. The monitors show the wrestlers as you select them. As each wrestler's mug appears on the screen, Bruno lists his best (player-selectable) moves and gives you an update of his wins and losses so far. When you choose a wrestler, his face becomes animated accompanied by a digitized sound sample of the wrestler's "voice."

They each have a choice two cent's worth to put in. For example, Mr. Cool exclaims, "Hang ten, baby!" with rock music in the background (cool, huh?); Sea Dawg warns, "I'll feed yer to the sharks" (complete with seagulls in the background), Sgt. Slam growls, "You're next, pal" (to the sound of machine-gun fire); and Sultan (who looks more like Karnak the Magnificent than a wrestler) intones, "Prepare to die!" with a glissando played on a sitar.

Now you turn the disk over and continue booting the game. It takes about a minute to load even with the V-MAX fast-loading routine. I became a little annoyed at this, because it happens every game-cycle. You should remember that the digitized sounds hog memory, so the game is always loaded after the "choose wrestler" sequence. It would have been a good idea to allow the player to toggle this feature off and on.



The learning curve is short, but there is enough challenge to make this game an "old favorite" in no time.

When play is initialized, you see the ring with two wrestlers inside and their partners outside. In the foreground is a crowd of fans; the fans don't do much until somebody wins. Strength meters for each wrestler are located at the top of the screen, with the active wrestler's meter in the upper position. As a competitor tires, the corresponding strength meter decreases.

The objective in *Take Down* is to pin your opponent by holding his shoulders to the mat for a count of three. All eight wrestlers have a basic set of moves you execute with the joystick. Move to the left, right, top and bottom of the ring using conventional left, right, up, down joystick movements. To tag your partner, move your wrestler close to his partner and press the fire button while pulling down on the joystick. While you are outside the ring, your wrestler "recuperates."

Quickly pressing and releasing the fire button with the stick in neutral position throws a punch. You can climb on the ropes and dive on your opponent by moving to the left or right corner of the ring and moving the joystick diagonally in the direction of the corner you want to climb. When you are ready to dive press and release the fire button. If you miss, you get "hurt." If your opponent moves away, you can climb down by moving the joystick down.

You can bounce off the ropes with a flying body tackle by backing your wrestler into the ropes and pressing the fire button as you bounce off. If you want to pin an opponent who is on the mat, move your wrestler directly over him, and your man will automatically jump on him and pin him. If the downed man has enough strength to get up before the count of three, he can throw you off. You can do the same by pushing the joystick up. You can let an opponent up from a pin to smash him further by pushing the joystick up, then you can jump on him again and again and again.

Each wrestler has his own set of four custom moves that can be activated by pressing the fire button and moving the joystick toward or away from your opponent depending on his location in relation to your wrestler. The moves include the

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Reviewed by Gary V. Fields

Personal Newsletter

Computer: Commodore 64 (GEOS Required)
Publisher: Softsync, Inc.
162 Madison Avenue
New York, NY 10016
Medium: Disk
Price: $49.95

Personal Newsletter was designed for all those GEOS owners looking for an easy-to-manage, yet relatively powerful desktop publishing program. This desktop publishing program is all most GEOS users will ever need to publish their own newsletters. I must admit that I am attracted to desktop publishing programs, regardless of which system they operate on. And though I have used, or at least tested, a dozen DTP programs for more powerful systems than the eight-bit 64 and 128, I am still amazed at the professionalism of all the publishing programs designed for them, including *Personal Newsletter.*

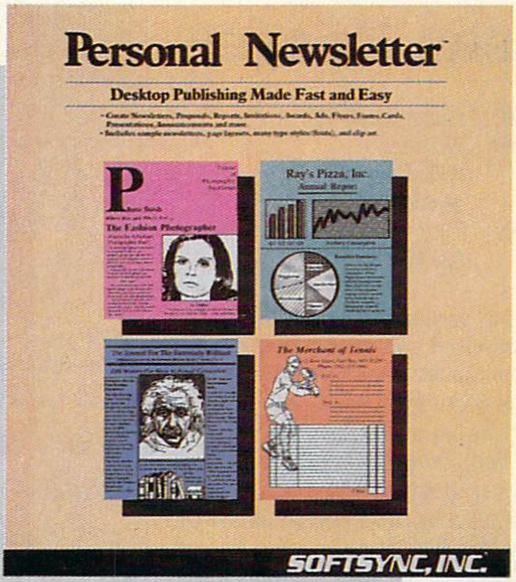
The program lets you lay out pages using as many columns as you want, mix as many fonts as the system's memory can handle (more than enough to go from elegant to gaudy), enter text directly using a built-in word processor and add graphics simply by pointing and clicking. The manual (hefty, complete and well written) offers tips for designing visually-appealing pages as well as suggestions on how to mix fonts to balance clarity with impact.

The program's environment is exactly what you would expect from any GEOS-compatible product—a desktop screen holds the icons which indicate program modules and files. To activate a module, you simply point at it and click. The program recognizes either a joystick or 1351 mouse, which work equally well. (I feel foolish doing serious work with a joystick, so I lay out pages with a mouse.)

The program is delightfully simple to use, logically designed, yet reasonably powerful and flexible. All design tools are activated by selecting from a pull-down menu. The eight options available from the main menu are photo, window, style, font, text, print, file and quit.

All operations are intuitively designed. For instance, to place a photo/graphic on a page, you simply click on the word *photo.*

This is a program you can boot and use without ever reading the manual—a statement I never make casually.



A new menu will appear which allows you to create, remove, move, change size or cancel the photo request. When you click on the word *create* it will be highlighted, and the arrow will jump down to the page. When you click again, a box will appear which you can size and position. When you click again the box's outline will become solid, and an image will appear inside. This image is the first graphic held by the photo album.

Now a new menu will appear showing directional arrows and a plus and minus sign. By clicking on the arrows you can move and crop the graphic as it appears within the box. By clicking on the plus and minus signs you can quickly scan through and select any graphic held on the work disk. I found this simple selecting and editing scheme sensible, effective and surprisingly fast.

Removing a graphic (or any window) is simple too. You just click on the "remove" option, then click on the window you want to delete and it is gone.

Text is added to a page using a menu-driven word processor. To enter type, you can either define a column to format the text within (you simply click on the window menu, click once where the upper-left corner of the column will be and then move down and to the right and click again where the column will end) or just start typing. By simply typing on the page, you can create large headlines. But column windows give you more control over the text, since they can be moved easily and when resized the text flows automatically to fit the new size. If you want to insert new text just point where you want the changes made and begin typing. Another menu option lets you cut, paste and copy blocks of text.

The style and font options let you select and mix different typefaces (University, Cory, Roma, etc.) and attributes (underlined, boldface, italic, reverse, etc.). Because the fonts are all GEOS standards, you can import any font you prefer, and the program will recognize it as well.

I thought I had uncovered a flaw in the program while I was choosing different font sizes. Halfway through creating a page the program refused to let me use font sizes larger than 18 points, and an asterisk appeared next to the offending font size. As it turned out the program monitors which fonts you have used and the amount of free memory left. Rather than let you exhaust your memory mixing lots of huge fonts, it restricts their use. I realize now that this is a sensible safety feature which actually saves time (not having to change layout or fonts trying to free memory) and prevents lockouts or crashes which might result if all the system's memory were used.

Personal Newsletter takes a sensible approach to creating graphics to use with the program—it doesn't offer any design options. Rather than "recreate the wheel" by requiring the user to relearn a new set of commands, the program relies upon *geoPaint* for graphic creation. This makes sense since the program must be operated from within GEOS (which comes with *geoPaint*). *Personal Newsletter* also includes a

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Ocean Ranger

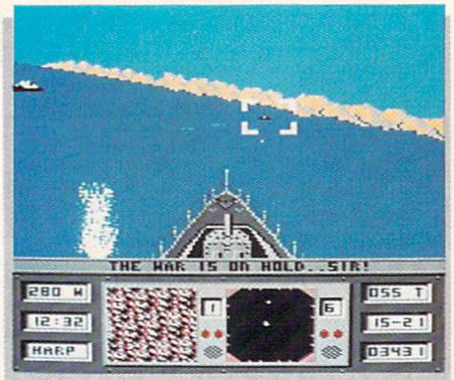
Computer: Commodore 64
Publisher: Activision
3885 Bohannon Drive
Menlo Park, CA 94025
Medium: Disk
Price: $34.95

Are you tired of the international game of cat and mouse those enigmatic Ruskies are playing? About had it with money-grubbing, nose-packing drug dealers? Had your fill of middle eastern crazies? Well, then it's time for a little diplomacy . . . Gun boat diplomacy, that is, and Activision has a game that allows you to do just that. The game is *Ocean Ranger*, and the object? Well, to quote the makers, "Kick butt or swim for shore!"

Reminiscent of the high-powered, overgunned PT boats of World War II, the *U.S.S. Ocean Ranger* is the world's fastest and most sophisticated ship of the small, missile frigate class, and you are her captain. Speed and fire power are definitely on your side. Advanced hydrofoil design and turbo-boost allow you to skim the brine at a whopping 55 knots! Your complement of offensive weapons includes surface-to-surface Harpoon missiles, surface-to-air Sea Sparrow missiles, depth charges and a 76mm cannon. In the defensive category you sport several devices for confusing and confounding the enemy's radar and guidance systems. Among these are CHAFF missiles which fire tin foil snow storms that screw up infra-red seeking weapons, and a thing called ECM (Electronic Counter Measures) that's guaranteed to fry the other guy's radar.

With this much speed, firepower and sophistication, the odds are definitely on your side, right? Forget it. The navy's got plans for all this hardware. Big plans, and being the captain of the *Ocean Ranger* is rather like drawing the short straw. You'll find yourself usually out-numbered and running missions that would make a kamikaze pilot quake with fear. However, if you can keep your wits about you, and react quickly to desperate situations, you may survive.

To get into the action, first read the comprehensive and well-written manual. It explains the various features of the *Ocean Ranger* in detail and adds to the role-playing aspect. Additionally, it explains how to create a play disk.



The object of the game is not to wipe out everything in the area, but rather to take out the primary and secondary targets.

You begin by entering a special code from the manual that allows you access to the Administrations Department. Failure to enter the proper code word immediately sends you to basic training. This allows you to play the game, but only in a limited sense. There's a trick to entering the proper code word, (I won't give away the secret).

Once the puzzle of access codes is solved, you're allowed entry into the Administrations Department. This allows you to review the records of other imaginary captains. The records list each captain's level of skill, theaters of duty, commendations and medals. The records also list the captain's current status. The object is to find a commander who has either retired or died at sea. Then delete his record and enter one of your own. To do this you enter your name on a standard record form, then you begin service with the rank of lieutenant. As you complete missions—either successfully or unsuccessfully—the game will automatically update your record to reflect your performance. By the way, it's customary to give yourself a good luck, tough-sounding, middle nickname such as Captain Adam "Shark" Banner. After a bit of trial and error, I found "Fish-Heads" was the luckiest one for me.

Once your record is created, you're presented with several menu options regarding type of assignment and theater of duty. Both assignment and theater indicate a different level of difficulty. Regarding assignments, the difficulty levels are Basic Training, Regular Forces, CIA, and—the toughest—NSC (National Security Council). Theaters of action range in difficulty from the Bearing Sea, Southeast Asia, Central America and (gulp!) the Persian Gulf. Of course, the tougher the assignment, the more points scored, the greater the glory, and—for the beginner—the quicker the trip to Davy Jones' Locker.

From Administrations, you proceed to the briefing room to view a slide show informing you of the actual details of your mission. These include the theater, the location of your home base, and the locations and type of the primary and secondary targets you're to destroy. If you accept the assignment, then it's off to ship's stores for provisions.

In fitting out your ship, you're allowed to make decisions on the amount and type of weapons you carry and whether or not you take on any extra fuel. Keep in mind the information gained in the briefing—it's invaluable. If your primary objective is, say, a MIG base, then you might want to go light on the depth charges in order to stock up on Sea Sparrow missiles. In addition, if the primary and secondary targets are a long way from home port, carrying a little extra fuel might mean the difference between success and failure. So never short yourself on any one item.

After equipping your vessel, it's off to the action. The saga begins with a view from the main bridge, overlooking the forward deck of the *Ocean Ranger*. In the distance you see the seascape of your home port. You hear the constant, idling thrum of the powerful, turbo-charged diesels, just waiting to be throttled up.

At the bottom of the screen are instruments and indicators to aid you in navigation and battle. These show your current heading, the time, the current weapon selected, the *Ocean Ranger*'s speed, your X-Y coordinates in relation to the chart of the area of operations, and your remaining fuel. Additionally, you have two small multi-purpose monitors. You can switch these display screens to show a view of the area, give information on weapon status, display a smaller versions of the sea chart or a radar screens, or target identification mode. This last feature is invaluable when attempting to distinguish between sea mines and submarines. Both mines and subs appear the same on the viewing screen, but each must be destroyed by a different weapon. For instance, firing the

76mm cannon will wipe out a mine, but will have no effect on a sub. I prefer to use one monitor in target identification mode, while using the other as a radar screen. It's a powerful combination, and a real aid in battle.

Obviously, only so much can be controlled via the joystick, therefore, the weapon controls, view from the bridge and most of the ship's systems are controlled by keyboard. Activision had foresight to provide a template that fits over the keyboard, and almost all of the ship's functions are controlled by keys at the edge of the keyboard, allowing for easy access. For instance, all weapons are controlled by the number keys.

By pressing the DELETE key, an area chart can be brought up on the main screen. The chart allows you to plot your course to the action; your home port is marked by a flashing letter "H," while the primary and secondary targets are marked by flashing letters "P" and "S," respectively. In addition, the position of the *Ocean Ranger* is marked by a white dot, while all enemy mines and craft are indicated by black dots. Be careful here, a black dot could represent a single enemy ship, or a whole squadron of MIGs. Also keep in mind that the object of the game is not to wipe out everything in the area, but rather to take out the primary and secondary targets. If you can plot a course that allows you to skirt around an unnecessary fight, do so.

But enough about strategy, what about the action? Lifting the anchor and easing the joystick forward engages the engines. As you move out of port, the seascape begins to move by and it's off to the fight. Holding the joystick forward increases the *Ocean Ranger's* speed, and the surrounding seascape moves by faster to reflect the change. At about 28 knots, the *Ocean Ranger* lifts off the water and onto her hydrofoils. At 35 knots, turbo-boost kicks in. However, always remember that turbo-boost eats up a lot of fuel. If you're running low on fuel, never try to make it to home port at top speed. Running out of fuel behind enemy lines is disastrous, so drop out of turbo-boost and take your time.

As you approach the enemy he will appear on your view of the ocean, and whatever the object (MIG, destroyer, sub, etc.), your targeting system automatically takes over and locks onto the nearest enemy craft. This is indicated on the screen by a set of square brackets around the advancing foe. Black brackets indicate that the target is out of range for the weapon currently selected. If this is the case, either hold tight and wait, or switch to a longer-range weapon, say, from the 76mm cannon to Harpoon missiles. When the brackets turn white, the target is in range, and your weapon can be successfully fired. Once a weapon is launched, the advanced fire-and-forget nature of the *Ocean Ranger's* weapons system allows you to immediately switch to the next enemy by pressing the space bar. This moves the brackets to the next closest target.

As the level of difficulty increases, so does the action. When you reach CIA and NSC level missions, you'll have your hands full. You'll find yourself under attack by more than one type of enemy at a time, and their attacks will come from several different directions. Fighting back not only becomes a matter of choosing the appropriate weapon, but also launching it in the correct direction. The function keys allow you to change your line of sight from the bridge, giving a full 360-degree view for firing.

If the constant onslaught weren't bad enough, you also have to contend with damage inflicted to your vessel. After all, the *Ocean Ranger* is powerful, not invincible. It's only a matter of time until you sustain some damage. When damage occurs, it's best to decrease your speed and quickly switch to the Damage Report screen (+ key) to ascertain the nature of the damage, then move to the Maintenance Crew screen (0 key) to assign the crew to the proper locations (e.g., the engines, the computer, the weapons or the hull). It's a good idea to always assign a few extra men to the hull prior to battle. The hull is where you usually take one, and let's face it, if your hull goes . . . the *Ocean Ranger* makes a lousy submarine.

Overall, the game is a good fantasy simulation of naval operations and ocean warfare. The game allows for role playing without getting corny. Battle action is fierce; and while the *Ocean Ranger's* controls (complete with keyboard template) are sophisticated enough to keep you busy, they're easy to master, and never become overwhelming. As for the graphics, they're well done, and move fairly smoothly. In its entirety, *Ocean Ranger* is slick and well laid out. So, if you've ever fantasized about how you'd fare as the commander of a fighting vessel, then definitely check out *Ocean Ranger*. By the way, if you ever make it to the Persian Gulf, keep an eye out. You'll probably find me adrift. Do me a favor, and throw me line. ■

Reviewed by Russ Ceccola

Q*Bert and TNK III

Computer: Commodore 64
Publisher: Data East
470 Needles Drive
San Jose, CA 95112
Medium: Disk
Price: $9.95 each



The best video games have always been in the arcades. Very few home video games ever let the player reach the level of excitement of arcade games. The elements that separate the arcade from the home are the atmosphere and sounds. Only in the arcade can you hear the sound effects of 30 or 40 other games while playing one yourself. Also unique to the arcade is the experience of making each quarter last as long as possible while trying to play as well as possible. Since you can't really capture the atmosphere of the arcade in the home, the next best thing is to capture the atmosphere of the games.

The Commodore 64 has long been a favorite of arcade fans. There are many arcade translations currently on the home computer market. There's no better company to publish these games than one that also produces arcade classics. Data East is such a company. With ten years in the arcade game industry under their belt, Data East knows what makes a good game, and they've moved their most popular games from the shopping mall to the playroom. So far their translations have been very accurate in game play. Although the Commodore 64 can't handle all of the graphics of the arcade machines, the results are impressive. Data East has a budget line of software in addition to the group of regularly-priced games that form the bulk of their home computer game business. The line is called the Moving Target Series and the first two entries in this group are *Q*Bert* and *TNK* III.

*Q*Bert*

For those of you who don't recognize *Q*Bert,* don't bother reading the rest of this article. *Q*Bert* is one of the arcade classics—right up there with *PacMan*—and if you don't know the game, then you can't be very much of an arcade game fan. Q*Bert is the colorful little character that looks like a cross between an Ewok and a Snork. You guide Q*Bert around a pyramid of colored blocks, changing the color of the blocks as you land on them. The object of a round of *Q*Bert* is to change all of the blocks to the same color. Although the rules to *Q*Bert* are very easy, strategy can be difficult to formulate in later stages of the game.

> Although the rules to *Q*Bert* are very easy, strategy can be difficult to formulate later in the game.

*Q*Bert* has nine levels, with four rounds per level. Each level has blocks that behave a different way when you jump on them. On the first level, the blocks change to the goal color when you jump on them and stay that color. In the second level, you have to jump on each block twice—once to change it to an intermediate color and again to change the block to the goal color. The third level is a bit different and much more difficult. Jumping on the blocks once changes them to the goal color. However, if you jump on them again, the blocks revert to their original color. As you can see, you must be very careful on the third level and beyond to choose an efficient path up and down the pyramid.

Each round within a level differs only in the colors used for the pyramid's blocks. Within a level, the blocks' behavior stays the same. I've never made it beyond the third level, so I don't know how the blocks behave in the later levels. You may be wondering how you can tell what the blocks' behavior is for a level. That's easy enough to answer. A short animated sequence at the start of each level shows Q*Bert jumping around on a small pyramid, and you can tell from the results of his jumps how the blocks will be affected. This is just one of many nice touches duplicated from the arcade version of *Q*Bert.*

There have been numerous public domain variations on *Q*Bert* under different names, as well as a couple of licensed copies of the game for the Commodore 64. They all fall by the wayside next to Data East's version, There are only two things missing from the original that don't appear in the home version: when Q*Bert falls off the pyramid, you don't hear the tiny plunger hit the side of the game cabinet where the character was supposed to hit the ground, and you don't hear any mumbling when the curse symbols (& # $%* @ ?!, etc.) appear above Q*Bert when he dies like you did in the arcade. Other than that, the translation is flawless.

Hopping around on the pyramid with Q*Bert are some other characters that can make things difficult. Numerous red

balls fall from the top of the pyramid and move from square to square. You have to be careful not to wind up on the same square as them.

After a little while with just the red balls, a purple ball drops and turns into Coily the snake near the bottom of the pyramid. Coily will chase you around the pyramid and will not go away. The only way to get rid of Coily for a few jumps is to lure him off the edge of the pyramid by jumping on the discs that are on certain sides of the pyramid. As you jump on a disc, it carries you to the apex of the pyramid. If Coily is within two squares of the place from which you jumped onto the disc, he will follow you right off the pyramid and die. You don't need the discs to finish a round, but their help is tremendous. The discs are two-colored instead of the multicolored ones in the arcade.

Green balls sometimes fall onto the pyramid. Get these immediately; they give you a large amount of points and freeze everything on the pyramid (except you) for a few seconds. This gives you a chance to finish a round without having to worry about enemies.

Two more pests pop up from time to time on the pyramid—Slick and purple monsters. Slick has sunglasses and jumps around randomly changing the colors of those squares he lands on—even those that are the goal color. Jump on him as soon as he appears before he ruins all of your work. The purple monsters take away a game life. Avoid them at all costs! That's about all you have to worry about in *Q*Bert*. The rest is just practice, practice and—you guessed it—more practice.

*Q*Bert* is a very good translation of the arcade game of the same name. As I said before, the graphics of the pyramid and characters are exactly the same as the original—only the status information (score, etc.) is represented a little bit differently. The sounds (especially the hopping sound) are also very well done.

The only thing that may throw some people for a loop is the use of the joystick. Because Q*Bert jumps on a pyramid of blocks, you don't jump up and down and left and right. Instead, the diagonal directions are the ones you use. Most joysticks are not eight-directional, so Data East added a nice feature that puts the crowning achievement on this little gem. The game recognizes the four compass directions of the joystick, requiring you to turn the stick 45 degrees to the right so that you are pushing the joystick in the correct direction in relation to the screen. Although it's a little awkward to hold your joystick this way at first, you get used to it quickly and will learn to appreciate this programming decision.

All in all, *Q*Bert* is a heck of a lot of quality for the price and certainly captures the game play of the original arcade classic.

TNK III

Unlike *Q*Bert, TNK III* was only moderately successful in the arcades. Nevertheless, the game is a strong challenge and certainly deserves to be brought to the home gaming world. Once again, the graphics greatly mimic those of the original, and the sounds are pretty much the same, without stereo speakers of course.

> In *TNK III*, you have to free your country from a dictator by destroying all his forces along the way to the base.

In *TNK III*, you have to free your country from a dictator by destroying all his forces along the way to the base. It sounds like there are insurmountable odds in destroying an entire army by yourself, but you forget what weapon you have at your disposal. TNK III is an experimental supertank that is very powerful and able to defeat the enemy if controlled by a steady hand. The tank is your only weapon and with it you must fight against other tanks, planes, submarines and soldiers.

In *TNK III*, you work your way toward the dictator's base by moving up the screen on a vertically- and horizontally-scrolling playfield. You can move backwards down the paths and screens, but only by a small amount. You always want to go forward, inching closer and closer to success.

Your tank can be controlled by either keyboard or joystick in a couple of different modes. The two modes are dependent on the way in which you control your turret. If you want separate control of the turret atop your tank, use the keyboard to rotate and fire the tank's turret gun. If you choose combined control of the turret, it will always face the way you are moving the tank, and the fire control will also fire the turret's ammunition. After playing *TNK III* a number of times, it was readily apparent that you should always play in combined mode unless you are a seasoned veteran, in which case separate mode serves as a handicap.

Regardless of which mode you choose, your game will last a fairly long time by arcade game standards. You start with four lives, but you can accumulate various weapons, energy and other tank lives as you play the game. If you are playing in combined mode, use a joystick; in separate mode, use the keyboard. The bulk of *TNK III* revolves around shooting at enemies, moving closer to your goal and collecting objects by moving over flashing letters. Get in good shots at the enemy vehicles and soldiers by making sure that you are lined up with your target. It's not something that's hard to do, but practice will ensure that every shot will be a hit.

The flashing letters I mentioned are the real key to winning *TNK III*. So far in my playing, I've seen the following flashing letters along the way: E, F, K, L, N, S and V. There may be more in the game—I don't really know. Unfortunately, the instructions are pretty simplistic and don't explain what each letter does and which members of the alphabet you can expect to see in *TNK III*. Each letter will have some effect when you move your tank over it.

The major part of the game screen is the area of the game universe in which you are presently located. Below the overhead view are your score, number of lives left (represented by an equal number of tank icons in a row), energy bar and counters for the letters V, F and S. Whenever you are hit by the enemy, your energy bar gets smaller depending on the type of enemy that made you its target. If it disappears, you lose a life. By running over E's, your energy bar is increased by about one-fourth of its maximum length. Moving over K's destroys all enemies on the current screen. Running over L's triples the range of your turret fire. Moving over N's gives you a new life. Finally, moving over V's, F's and S's increases their respective counters. If you get five V's, the counter resets and you have increased fire power. All of the effects of the letters are cumulative. I still don't know what F's and S's do—confusion that could have been avoided by printing accurate directions for the game. In any case, get any and all letters that you see. They are the heart of *TNK III*.

There are four types of mobile tanks in the game and one stationary tank. Each of the mobile ones has a different point value, and the immobile tank doesn't increase your score at all. Just so that you know (because this information is not contained on the instruction sheet), the MG70 tank is black, the ST54 is blue, the

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Reviewed by Edith Chasen

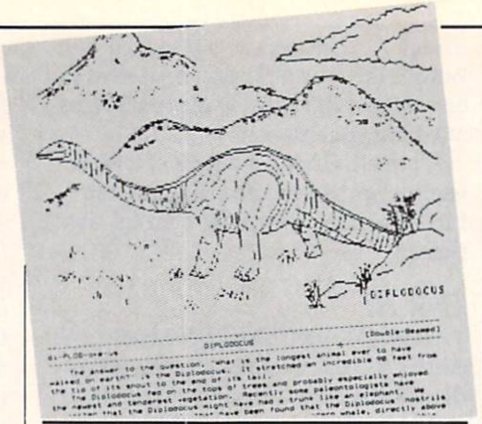
Designasaurus

Computer: Commodore 64
Publisher: Britannica Software
345 Fourth Street
San Francisco, CA 94107
Medium: Disk
Ages: 4–11 years
Price: $29.95

Designasaurus is a lot of fun! It is wonderful to see a program which is not only educational, but genuinely entertaining. You don't have to be a child to appreciate this software—I thoroughly enjoyed using it. The sound effects are perfectly matched to the program's content: when the dinosaurs move slowly, lumbering footsteps are heard. When the dinosaurs become livelier, the sound speeds up. The sound even corresponds to the bouncy movements of the dinosaurs' heads as they walk. The graphics are excellent; when your Brontosaurus eats part of a tree for dinner, you can watch him chew!

The program is divided into three main sections—printing, building your own dinosaur or walking your dinosaur. The printing module lets you print out 12 predrawn dinosaurs in three sizes—6 × 8 inches, 11 × 17 inches, or even as a T-shirt transfer! Transfer paper is packaged with complete directions, along with an address where you can send away for more. You can print out the dinosaur as an outline to color in later. The menu-driven printing module is very easy to use—you choose the size printout you want, and if you are using a Commodore- or Epson-compatible printer. The software does the rest. Additionally, you can preview your picture on screen before printing. If you need them, the manual includes further directions which are clear and concise. This is a real relief; I find that so many otherwise excellent programs come with such complicated printer instructions that they become very difficult to use!

The option to build your own dinosaur is very intriguing, opening up a whole new set of possibilities. Your own creativity is the only limit here; you can build any kind of dinosaur you want. You are introduced to a paleontologist standing next to a file cabinet in a museum. The file cabinet contains drawers labelled head, neck, body and tail. This program exhibits a great sense of humor—after



The option to build your own dinosaur is very intriguing, opening up a whole new set of possibilities.

you choose the part you want, the paleontologist opens the file cabinet by giving it a kick with his foot! The part then appears on screen, along with a listing of its name; age in both geologic time and millions of years; phylum, class, order, family and other important data. When you are finished creating your dinosaur, you are presented with its likely traits. For example, the one I created with parts from both plant- and meat-eaters would have had a hard time surviving, for it couldn't decide which type of food it should eat!

The option to walk your dinosaur is my favorite part of this program. You can take Brontosaurus, Stegosaurus or Tyrannosaurus Rex on a walk through five ecosystems. This is not only fun, but also teaches the meaning of an ecosystem—of how everything your dinosaur does affects the total environment. Logical thinking has to prevail here, for if you don't feed your dinosaur enough on its travels, it will die before it gets very far. Plus, you have to be sure to protect it from predators. The animation on the dinosaurs is outstanding—they look around them with wary expressions on their faces, they have a bounce to their step, and if they die, they actually curl up and fall down on the landscape. I like the way this is done, as it is not gory or frightening to a youngster.

Each ecosystem is labelled on the bottom of the screen with the geologic time name and the millions of years before the present that it represents. I did find an error here in the age of a Pre-Cambrian swamp, which was dated at 230 million years ago. Dinosaurs did not live in the Pre-Cambrian; this marks when life on Earth was first emerging about 2300 million years ago. The author must have meant the Triassic, when the dinosaurs evolved, beginning roughly 230 million years ago. This may not seem that important, but these are landmark dates in earth science.

At the top of the screen are colorful horizontal bar graphs which help you keep track of the variables in the environment. These list the type of terrain, your dinosaur's health, its calories (energy level), the amount of herbivores and carnivores in the vicinity, and the amount of vegetation. These bar graphs are a great idea; they teach not only how to read a graph—an absolute essential for every child to learn—but also how to develop a sense of tracking what your dinosaur needs to make its way through each ecosystem. Thus, while you are enjoying the animation, you are developing logical thinking; learning math skills, biology and geology; and cultivating a sense of time as to the history of life on Earth.

When your dinosaur has finally made it through all five ecosystems, you are congratulated and presented with a certificate made in your name. You can view it on screen or print it out. The one error I caught on the certificate was that it read "for a walk through five eras," instead of "five ecosystems." This is important to those who study earth science, for the dinosaurs only lived during the one Mesozoic Era of geologic time. The program takes you through that era's three subdivisions of time, which are called "periods," not "eras." However, if you can overlook this, the certificates are a great idea, for they have small dinosaurs on the borders and are well laid out and impressive to look at.

The program is copy protected, which means that you will have to take care not to inadvertently damage your disk. If you do, Britannica offers reasonably-priced back-ups. It worked fine with my Mach 5 and FastLoad cartridges installed, but they may be redundant, as the software has its own fast loader built-in. A joystick is not required as stated on the outside of the package but is optional as stated in the manual.

The two factual errors in geologic time that I found in this program do not detract from my opinion that this is the best program I have ever seen on the dinosaurs. The presentation of facts is successfully done in an amusing and enjoyable way. I am very impressed by this software and highly recommend it.

Reviewed by Steve King

TechnoCop

Computer: Amiga
Publisher: U.S. Gold
Epyx, Inc.
600 Galveston Drive
Redwood City, CA 94063
Price: $49.95

The object of the game is to speed to 11 different crime locations and capture or eliminate the crime kingpins.



TechnoCop is a slick arcade game that combines the thrills of auto racing with the excitement and surprise of a shoot-'em-up. You are cast as a twenty-first century cop, complete with a VMAX twin turbo interceptor squad car and computer wrist console. The object of the game is to speed to 11 different crime locations and capture or eliminate the crime kingpins who reside in those run-down, rat-infested tenement buildings. Obviously not an easy goal.

Each game begins with TechnoCop in his VMAX ready to speed off on his mission. The top portion of the screen is the road with a mountainous backdrop as viewed through the windshield. The bottom portion is a nicely-drawn graphic representation of the dashboard, complete with speedometer, tachometer and gear indicator. Your crime computer, located on the right side of the dash, primarily provides information as to the distance to and time of arrival at the next crime scene.

If you reach the destination within the allotted time, you will receive 50,000 bonus points. But this is made difficult by DOA (Death on Arrival) vehicles such as motorcycles, cars and trucks that are constantly trying to prevent you from succeeding. You also had better watch out for those DOA thugs who jump onto the VMAX from passing trucks and attempt to pound their way in. As you speed down the hilly winding road, you must avoid crashing into these vehicles or letting them run you off the road, as this not only costs you valuable time but also damages your VMAX. The dashboard also contains a damage gauge; when it hits bottom the game's over.

In the beginning, you are armed only with a side-mounted cannon which you use to blow away those nasty, obstructing vehicles. If you wish, you can also run them off the road, but then you run the risk of losing control of the VMAX. As you progress through the game, you are rewarded with additional weaponry such as hydraulic ram wheels, rapid-fire cannons and, of course, nuclear bombs! The driving portion of the game is extremely smooth and responsive to joystick control, and the digitized engine and braking sounds add a touch of tension and realism to the game.

When you finally arrive at the crime scene, your VMAX automatically pulls off the road, and a highly animated TechnoCop jumps out, ready for action. The top half of the screen now shows TechnoCop as he winds his way through the tenement, while the bottom half displays an arm onto which the "wrist command console" is strapped. This console is a highly advanced version of Dick Tracy's wrist watch radio which contains your crime computer, strength, health and number of lives indicators, and clock. It also has your criminal radar locator which aids you in navigating your way through hallways and elevators to the targeted criminal.

As you proceed (very cautiously, of course) you will be confronted by numerous DOA thugs who will attempt to inflict great injury upon you with flying knives, whips and chains. The idea is to shoot them before they deal you a fatal blow, as five such blows end the game. There are many options; TechnoCop can crouch, turn and take flying leaps over all obstacles. A successful DOA hit is quite graphic—when a thug is shot, he lets out a sickening moan, collapses in a pool of spurting blood, and quivers a bit before dying.

Careful in your shooting, though—it's quite easy to accidentally shoot those little boys playing on the sidewalk and lose valuable points. You also have to watch for those holes in the floor, since you can fall through to the floor below. While this is sometimes a useful alternative to the elevator, some of these holes go through two floors which is too great for TechnoCop to withstand.

If you are lucky enough to get anywhere near your targeted kingpin within the allotted time, you will be warned by a digitized clanging sound. You may be instructed to capture rather than kill the kingpin; if so, switch weapons to your net. You will often be mysteriously killed before you even see him, so once you hear the clanging, open fire in all directions. If you don't catch him in time, you will be advised that he escaped and directed to return to your VMAX to proceed to the next crime scene. Arrive at the crime scene in time, and you will receive a promotion and an extra life.

By the way, you can amass additional points along the way by picking up stolen loot and rescuing hostages. Other impediments are exploding bombs and vicious rats and dogs that bite your leg and cause you to hop around on one foot—taking up valuable time. Needless to say, the further you progress, the more difficult it becomes to reach your destination and eliminate the thugs.

All in all, *TechnoCop* is an arcade-quality product which will provide hours of entertainment. The graphics are excellent, the animated movement is smooth, and numerous high-quality digitized sounds add realism to the game. And at any time during the driving portion, you can save the game to disk which is extremely helpful as you advance through the various levels. As in most arcade games, you can save high scores to disk. While I am not particularly an arcade game aficionado, I found *TechnoCop*'s dual game approach (driving plus exploring/shooting) to be both challenging and engrossing.

Reviewed by John Ryan

4th & Inches Team Construction Disk

Computer: Amiga
Publisher: Accolade
550 S. Winchester Blvd.,
Suite 200
San Jose, CA 95128
Price: $14.95

I'm a New Orleans Saints football fan. (So, sue me.) Yes, I love the Saints! And since receiving Accolade's *4th & Inches Team Construction Disk* for my Amiga, I can now enjoy watching my favorite team play, regardless of the season.

This team construction program is a companion disk designed for Accolade's very popular football simulation, *4th & Inches*. Whether you need a "Fridge" for your Beavertown Bears or some other human appliance, you can now pattern teams after your favorite NFL or college club, or a make-believe team manned by your best (or worst) friends. You can assign specific statistics and abilities to each of your players, rename them—or the whole team—and even choose a team's color. The possibilities and variations are just about endless.

The program includes an easy-to-read nine-page booklet that takes you through the straightforward construction process. You'll find six pre-constructed teams available on the disk. You'll also find an empty roster you can use to form an entirely new team. Go ahead and modify these teams if you wish, but after you get a feel for the editing process, you may want to use the pre-constructed teams as a guide to create a club from scratch.

Whatever the case, you must choose whether to modify a home or visiting team from the program's colorful opening menu. All menu functions are mouse driven, so just click to edit a home or visiting team, which will bring up a directory of teams currently on the disk. From this directory you can opt for a team to modify by loading it into memory.

Although you may save edited teams to the construction disk itself, I caution against it and advise you to save teams to a separate, formatted diskette instead.



Whether you need a "Fridge" for your Beavertown Bears or some other human appliance, you can now pattern teams after your favorites.

While it may be a hassle to deal with two diskettes instead of one, it will be even more of a hassle to send away for a new disk in the event of a disaster. (A backup from Accolade will set you back $10.)

With a team in memory, you can begin the process of constructing or modifying the team. On offense you can edit the first- and second-string positions for Quarterback, Fullback, Halfback, Wingback, Tight End and Wide Receiver. Defensively, the Linebacker, Cornerback and Safety positions may be altered. Offensive and defensive lineman, as always, are pretty much shadow players, and are not available for editing.

The *TCD* uses five separate categories to define a player's stats and abilities: name, height, weight, experience and ability. You can move about the screen by clicking on a player stat to bring a flashing cursor to that particular data area. Player names are confined to 13 characters. This should be satisfactory for most names, though you may need to abbreviate some.

Next you must enter a player's height and weight. Of course, it's necessary to look at this from a coach's standpoint, for while it may be cute to have a quarterback who is only five feet tall, he'll probably get a lot of passes slapped back into his face. Likewise, you probably won't want to set your halfback's weight to 150 pounds. Player weights can range from 0 to 399 pounds; heights may fall between 4′ 0″ to 6′ 9″.

The next two data areas determine a player's experience and ability—probably the most important statistics of the four. Experience level is the number of years in the league, and may be entered using any combination of six characters, including spaces (Rookie, 2nd Yr, 3rd Yr, 5th Yr, etc.). The higher a player's experience level, the better he'll be able to read and react to circumstances on the field.

This is, of course, directly tied to the player's ability, of which there are eight possible choices: Quick, Steady, Solid, Strong, Fast, Speed!, Tough and Big! An effect chart for each of these abilities is detailed in the documentation and explains the relationship of each as applied to all the team positions. While a Fast halfback is fleet, for example, he'll be fairly easy to tackle. There are many trade-offs to be considered when you assign abilities.

Once you have constructed the team roster, you may want to rename the team (limited to eight characters). Moreover, you can specify a team's trouser, jersey, skin and flash colors. This is accomplished by clicking on the option, then using three slider bars to mix a combination of red, green and blue. (However, some of the color combinations will also affect the screen display after you return to the team roster. When I selected black for my pants and jersey colors, I was unable to see my roster when I returned to it.)

After you've edited one team, you can build an entire league if you wish. I found that team construction could be competition in itself by having a friend build an AFC league, while I concentrated on an NFC league. Regardless of how you go about it, you can start testing your new team immediately by clicking on the "Play *4th & Inches*" gadget. If you don't like the way your new franchise is working out, go back and rearrange starting positions or abilities. It's that easy.

This handy, low-priced companion disk will squeeze a little more enjoyment out of *4th & Inches*. Admittedly, it would be very easy to build a team of unbeatable superstars, but that would take the fun out of the hallmark unpredictability of the game. More often than not, it is the coach—his selection of plays, players and their attributes—who determines the outcome of a game, not the players themselves. With both programs, you are player, coach and owner, so now, to coin a local Saints phrase, there's no Mora excuses! ■

Reviewed by Jeffery Scott Hall

Hole-in-One Miniature Golf

Computer: Amiga
Publisher: DigiTek Software, Inc.
8910 N. Dale Mabry
Executive Center, Suite 37
Tampa, FL 33614
Price: $39.95

Hole-in-One Miniature Golf, from DigiTek Software, brings home the fun and excitement of the real thing plus a little extra. After the game has loaded, a course screen will display several options: a tutorial which gives you a nice graphic explanation of the game, classics that give the beginner quite a few shots for the first-time golfer, and expert holes for the more advanced player. At this time, you may also insert an additional course disk to play which will give you the same basic set-up as that described above. The second disk that comes with *Miniature Golf* gives you two different courses to select from—Intermediate and Menagerie.

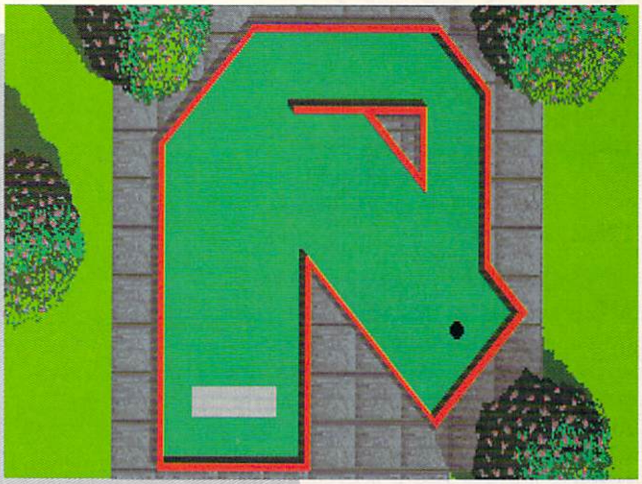
Now, let's find out just how this game compares to the "real thing."

Fore!

After choosing your course, you can select up to four competitors. Then the first hole of the course you've chosen will appear, and you're finally ready for the first stroke. No matter what hole you are on, you will always start by placing your ball at the starting pad which is a small white strip. Once the ball has been placed, you will need to extend a line from the ball to the pointer. The direction in which your line is pointing is the direction in which your ball will go. Distance between the pointer and ball determines the amount of power that will be used for the putt. When you are ready to shoot the ball, simply click the left mouse button and away it goes! This system is so simple to use, that practically anyone of any age can learn to use it.

The game allows you to go three shots over par, but if you miss any more the message "over stroke limit" will appear. When this happens a one-stroke penalty will be given and you either advance to the next player or hole depending upon the number of players. The number of holes per course is 18, and an automatic score display will be shown at the halfway mark of the ninth hole.

The unique holes you will face include animated windmills, a daring attempt for a hole-in-one across shark-filled waters, and a hole inside a pinball machine.



One of the nicest aspects of *Miniature Golf* is the great use of graphics and sound effects throughout the game. Some of the unique holes you will face include animated windmills, a daring attempt for a hole-in-one across shark-filled waters, and even a hole inside a pinball machine. The digital sounds of the putt, ball and cheering of the crowd for a hole-in-one shot is also an added plus for the game.

Miniature Golf includes a whopping 72 fun-filled holes, of which I've mastered only 36. At any point in the game, you can access the pull-down menus giving you various playing options.

Choosing Your Golfing Options

The first menu gives you the following options: Score (allowing you to view your current score and also change the names of players), Replay (lets you view your last shot), Retry (allows you to try your last shot over), information about the authors, and Quit the game.

Note, the Retry option works only if you are playing a one-player game. This is because it's a practice option only, and would allow others to cheat in a real game.

The second menu includes options which allow you to toggle the sound effects on or off, prompt you before going to the next player, toggle the expert feature which vanishes the line used for the ball, and advance to the next hole without finishing causing a nine-stroke penalty.

The third menu contains two options—Direction and Contour. Some of the holes you will encounter have elevations for a greater challenge, and selecting the direction option will allow a player to view the hole in the desired perspective. Once you've selected your direction of view, you can then select the contour which displays the chosen perspective.

Summary

Miniature Golf is the best home golfing game of its type. DigiTek has employed a simple method of putting the ball so that just about anyone can enjoy it. The graphics are very clever and are combined with some very nice sound effects to make you feel like you're actually there.

Putting Pointers

- When putting, try not to hit the ball too hard. This will not cause the ball to go in any quicker, and will end up hurting your score. On the other hand, if you hit it too softly you will also hurt your score. After a few games you will soon catch on; most of the time a nice medium putt will do the job.
- Learn to plan your shots in advance, it can pay off in the long run.
- Whenever you encounter a hole that is behind an obstacle, try to angle your shot to bounce it off a wall opposite the hole. This will cause the ball to rebound close to, if not right in the hole.

Reviewed by Nick Wild

Road Raider

Computer: Amiga
Publisher: Grey Matter
Distributor: Mindscape Inc.
3444 Dundee Road
Northbrook, IL 60062
Price: $49.95

Road Raider, an exciting new Amiga release, is set in a world devastated by a biological holocaust. Killer cars driven by blood-thirsty criminals control the street. Slimy mutants run rampant, terrorizing cities. The whole mess started when Dr. A. Noid addicted the population to Slu, a low-cost food substitute. Dr. A. Noid has imprisoned hundreds of people in cities and is using the world as his demented playground. You're the Hunter—the one man who can restore order and save the remnants of civilization. You set out to find the mad doctor and claim your bounty.

Road Raider has three different action scenes: city streets, demolition derby-type arenas, and abandoned buildings. All the stages in *Road Raider* are nicely displayed from a bird's-eye view. As you drive around, the game's atmospheric graphics are unveiled. You start the game behind the wheel of your Armored Tactical Vehicle (ATV). A cross between Bigfoot and a tank, your ATV is one *mean* set of wheels!

Revving up the ATV, you set out to explore the first city. Hordes of cars intent on your destruction wait for you around every corner. If you spot an interesting building you can pull up and enter. After a short disk load you're greeted with an interior view. Like in *Gauntlet*, you move around the scrolling rooms blowing away mutants left and right.

Exploring the building carefully can be very beneficial; food and many items to power up your character and ATV are hidden in various places. Gadgets such as smoke dispensers, multiguns and armor plating, not to mention an Uzi or two, can be found lying around on the floor. These are not only deadly to your foes but also great fun to use. With equipment in hand and ammo and health at low levels, it is best to beat a hasty retreat to the safety of your ATV. Back in the street, rev up the engine and roar down the street to the local gas station. At a gas station you can trade in your food for gas, repairs, ammo or weapons.

A cross between Bigfoot and a tank, your ATV is one *mean* set of wheels!



Eventually you will find the a credit card-sized arena pass lying around in a building. Following logic only a bounty hunter could understand, you set off for the Arena of Death. As you pull into to the arena, a billboard showing your character and your opponent appears. Your adversaries range from The Killer Granny to an ogre. Now your life depends on skill alone. Don't plan on using your gun or any gadgets, this competition is car against car. Since your ATV would be awkward in the arena, it's time to wheel out your ram car—a modified Ferrari Testarossa. The ram car is faster and more maneuverable than the ATV.

Once in the arena there is no turning back. To leave the arena alive you must destroy all the enemies, avoid booby traps and pitfalls and finally destroy the boss. A few seconds in this joint and you are going to find out how the arena of death earned its name. Mines scattered though the arena explode with little warning. One wrong turn can turn the screen into a fireball. Quick turns are required to avoid pits that open in your path. To really heat things up, throw in a half dozen armor-plated cars with crazed mutants behind the wheel. Now that the fun has really started, you have to not only navigate an obstacle course of death, but you must also destroy *all* the mutants bent on your destruction.

Just when you think you've won, out comes the big cheese. Having defeated his legions, you must face the leader and his car in one-on-one combat. Surprisingly, the leaders do not present much more of a challenge then their minions. The boss can be killed by either repeated collisions to his weak spots (both sides) or pushing him into a pit. I found the bosses can be fooled quite easily. In fact, the first time I reached Dr. A. Noid he killed himself before I could lay a fender on him. Despite this problem, the arenas are still very challenging and should leave most game players sweating.

Road Raider is one of the best Amiga games to date. The tremendous playability of this game is refreshing. Combined with the excellent, often cartoon-like graphics, *Road Raider* is an excellent diversion. Three levels of difficulty and two modes of joystick control show thoughtful consumer-minded development. Depending on your preference you can simply press the direction you wish to drive. Alternately, pressing the joystick forward accelerates, pulling back slams on the brakes, and pressing right and left turns you in that direction. A save game feature makes this more than just an arcade game, it's nice to see a fast action game that doesn't require starting from the beginning each time you play.

The only qualm I have is the lack of music. Sound effects are abundant, but unfortunately, music is not included. *Road Raider* offers challenging and exciting game play to anyone who enjoys fast-paced action. Finally, a small hint: save the game before you enter an arena. You're going to have to try more than once to win at these stages! ■

Reviewed by Gary V. Fields

Virus Infection Protection

Computer: Amiga
Company: Discovery Software
163 Conduit Street
Annapolis, MD 21401
Medium: Disk
Price: $49.95

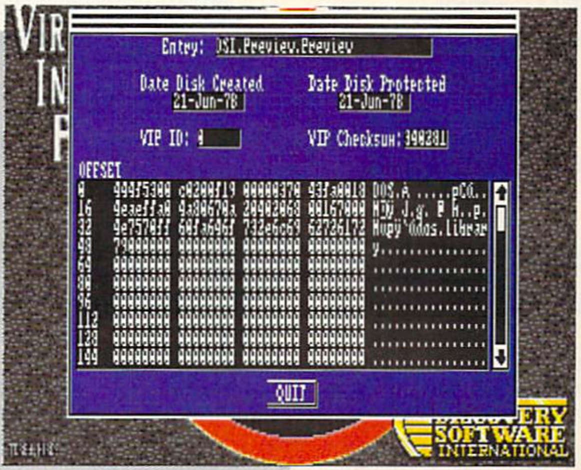
In recent years, no single word has sent more chills down the computer owner's back than *virus*—and for good reason. Computer viruses seized more than headlines in 1988; for a while it appeared they might actually hold the computer community hostage. Most of us had some stressful months last year as one news report after another released the dreaded truth about different virus strains which threatened every computer owner's software library.

For the benefit of anyone who has been asleep at the keyboard, a computer virus is a destructive piece of code which can silently invade and destroy a healthy disk. Most viruses are introduced to the host computer via a normal program on which the virus is invisibly attached. Once introduced, the virus duplicates and shields itself in some unused portion of the computer's memory and waits for a healthy disk to be pushed into the drive. As soon as this happens, the virus quietly spreads by writing itself to the unsuspecting disk.

In an Amiga, the virus normally lodges itself in a disk's boot block. Like a human virus, this germ-laden code quietly reproduces itself again and again until some internal timer triggers a revelation of its destructive presence. Unfortunately, by the time this announcement is echoed on the monitor, the virus has already done considerable, and possibly expensive, damage to the user's library. Viruses are coded and distributed by people with sick minds who get a kick out of destroying the property of others. Some viruses appear to be merely child-like pranks while others are intentionally destructive.

Regardless of the intent, almost all viruses infecting the Amiga community have been smuggled in on a disk's boot block. On most disks this area is left blank, on others it contains the information to make the disk self-booting, and on some commercial disks this area is used by the developers for special code or copy protection. Viruses can do the most damage on disks which have custom boot blocks. If a virus rewrites a custom boot block, the disk will become absolutely useless. Because any investment in commercial software can quickly add up to hundreds, even thousands of dollars, a user can lose sleep wondering if a virus has invaded his collection.

To provide security, *V.I.P.* attacks viruses with three strong weapons: identification, protection and reconstruction.



The single purpose of *Virus Infection Protection (V.I.P.)* is to help the troubled Amiga community sleep nights by securing against the invasion of software viruses. To provide this security, the utility attacks viruses with three strong weapons: identification, protection and reconstruction.

Identification

The first line of any successful defense is identification of the enemy. After *V.I.P.* has been activated, the user can have it inspect any disk for a known virus by simply inserting it into a drive (the program supports four drives—df0: through df3:). If a virus or non-standard boot block is recognized, the program reports its findings (including a display of the code in the boot area) to the user.

At first glance, this virus detection utility appears to be no better than those found in the public domain. (Before I continue let me echo my own appreciation to those faithful programmers who have developed and contributed their excellent utilities to the public domain.) But the problem with most PD detection utilities is that they are only capable of identifying viruses which appeared before the utility was released. Unfortunately, new strains of viruses are certain to appear. *V.I.P.* gets around this limitation by utilizing a database of identified viruses.

Whenever the user detects a new virus strain in a boot block, he can have *V.I.P.* add the image of that code to a database it uses when examining disks for viruses. Thus, as soon as a new virus is released, the user can add its image and name to the database, and from that date forward the program can recognize its presence on any disk it examines. Because it is impossible to identify something which has not yet been created, this scheme is not foolproof. But to date this approach provides more complete and up-to-date protection than any utility I've seen.

Because the program reports the presence of any non-standard boot block, it is possible for the user to erroneously add non-infectious code to a database. This doesn't hurt anything, but each time that disk is checked, the presence of the "new virus" will be reported. Should this error occur, *V.I.P.* allows the user to delete the mislabeled virus at any time.

Protection

The primary target of all Amiga software viruses at this writing has been the disk's boot block. [**Editor's Note:** *It had to happen—see "Amiga Public Domain" on page 74 for an update on the first non-boot-block virus.*] Since the security of the disk cannot always be guaranteed, *V.I.P.* maintains still another database to pro-

Continued on page 79

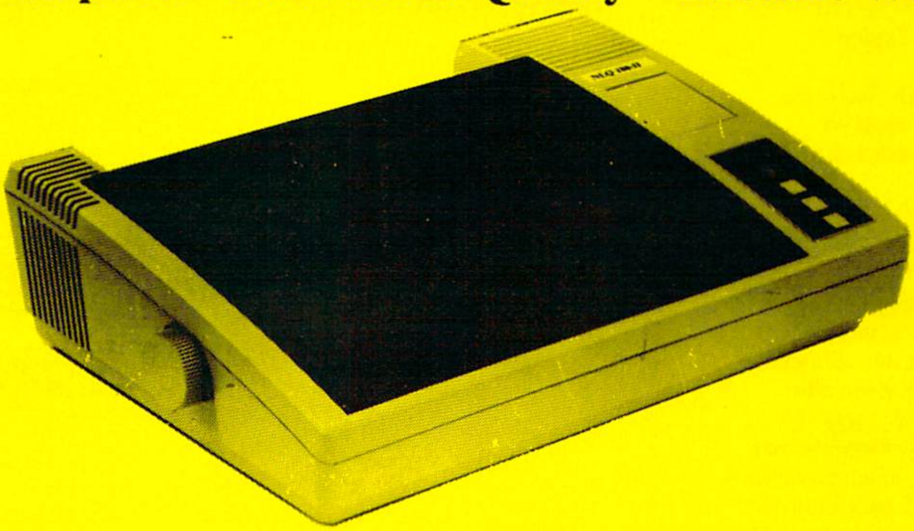
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Printing Method
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Printing Speed
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30 CPS at Near Letter Quality

Printing Characters
Standard 9x9 dot matrix
NLQ 12x18 dot matrix (33 cps)
Character size: 2.12 x 2.8 mm (standard)
Character sets: Full ASCII character set (96)
32 International characters
Centronics parallel port

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Ribbon Life: 3 million characters/cartridge

Physical Dimensions
Size: 15" x 12" x 5"
Weight: 12.7 lbs.

Carriage
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Maximum Number of Characters

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Standard enlarged	5 cpi	40 cpl
Elite:	12 cpi	96 cpl
Elite Enlarged:	6 cpi	48 cpl
Condensed:	17 cpi	132 cpl
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Reviewed by Gary V. Fields

Intellitype and Mavis Beacon Teaches Typing

Intellitype
Computer: Amiga
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Price: $49.95

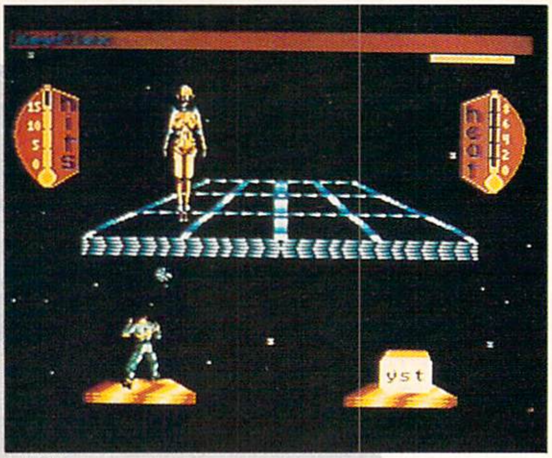
Mavis Beacon Teaches Typing
Computer: Amiga
Publisher: The Software Toolworks
13557 Ventura Blvd.
Sherman Oaks, CA 91423
Price: $49.95

The memory of my high school typing class, where I tried in vain to force a metal slapping monster into submission, has not faded with time. Even after months of trying my best, I was able to squeeze only 37 words per minute from the unwieldy, cold grey, manual typewriter (when I was 17, word processors and personal computers were unknown). My typing class consisted of 35 minutes of non-stop pounding, trying to duplicate a lesson from the textbook, ending with ten minutes for each student to grade his neighbor's work by comparing the total words typed and the number of mistakes. It goes without saying that in those days, very little thought was given to targeting a student's weaknesses and then attacking them so as to improve overall performance.

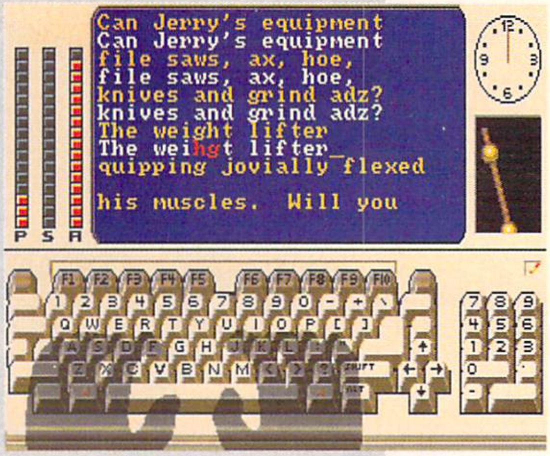
While typing was not my favorite class, much of the success I have today would not have come had I not learned that skill. Learning to type has always been important, but never has been much fun. When I think of typing classes, I usually envision hours after hours of monotonous drills.

Today all that has changed. Typewriters have given way to keyboards and word processors and typing classes are, more often than not, centered around electronic typing tutorials like *Mavis Beacon Teaches Typing* or *Intellitype*. While the machines which are controlled by a keyboard have changed dramatically in just the last 20 years, the skills required to use the machines have not. Regardless of whether you are using an ancient Underwood typewriter or the latest version of *WordPerfect,* the input device is the same—a keyboard. And the skills required to control those keyboards have not changed either—you must know how to type. But because of programs like *Mavis Beacon* and *Intellitype,* today's students can not only improve their typing skills more quickly but may also enjoy the learning process.

Perhaps *Mavis Beacon*'s most appealing feature is the pair of ghost hands which echoes your own as you take any of the program's classes.



Intellitype



Mavis Beacon Teaches Typing

Mavis Beacon Teaches Typing

This typing teacher combines drills with excellent graphics and even an arcade game to attempt to create an environment which is not only comfortable for the student but borders on fun. A series of pull-down menus lets you adjust *Mavis Beacon*'s controls to suit your personal preferences. For instance, you can turn the click sound heard when you press a key off or on, or your can redefine the keyboard as either "QWERTY" or "DVORAK," or turn the word-wrap feature (found in most word processors) off or on. Once you're enrolled, the program always gives you the option to either try the next lesson or move on to something else (like a game or practice)—options my human teacher never considered. I think most student's will appreciate *Mavis Beacon*'s tender teaching methods.

As you would expect, the main program consists of drills followed by analysis of the student's progress. After the completion of each lesson, the student is given the option to view a graph comparing his or her present abilities against the speed and accuracy which is their goal. These graphs highlight areas where the student is having trouble (like finding: >, ?, #, shifted keys, etc.). Each graph displayed allows the user to sort information in a variety of ways to easily pinpoint trouble areas. After each lesson and analysis the program suggests lessons which the user can take to strengthen problem areas.

Beyond just keeping class, *Mavis Beacon* also includes a free-time practice area, where novice users can go any time they wish. Old hands at a keyboard may not

appreciate the value of this practice area, but new Amiga owners will. Without such an option, there would be no good way to become accustomed to the layout of the keyboard without taking a graded lesson.

Perhaps *Mavis Beacon*'s most appealing feature is the pair of ghost hands which echoes your own as you take any of the program's classes. When you enter a classroom, the computer screen will display a three-dimensional Amiga keyboard and monitor. Over the home keys on this display is what appears to be the shadow of two hands. Whenever the user presses a key, not only does the symbol appear in the display area above the keyboard, but the ghost's hands press the same key. The value of these hands is that they always display the correct hand placement for typing a key—regardless of which finger the user uses. If you can train yourself to match up your fingers with those of the ghost, you are on your way to developing good typing habits—the key to accuracy and speed.

In an effort to bring entertainment to the classroom, *Mavis Beacon* includes an arcade-like auto racing game. The game puts you behind the wheel as you try to outrun the car beside you, but instead of stepping on the gas pedal to accelerate, you must type the words which float past your windshield. In actual play, I found the game less appealing than I had hoped primarily because the messages you are expected to duplicate consist of words formed from "cloud" letters. I like the idea, but I found some of the "cloud" letters hard to distinguish (e.g., the letters "M" and "N" look very much alike). But despite my single complaint about the race game, I suspect children will really enjoy the challenge. I tip my hat to the program's designers for at least trying to bring some entertainment to the often-boring task of improving typing skills.

The *Mavis Beacon* disk includes another plus which many users will appreciate called "Resume Writer." As the name suggests, this little utility helps the student create and print personal resumes using a simple fill-in-the-blank method. So after you complete your teaching class, just like a good teacher, *Mavis Beacon* can help you get your foot in the door for employment.

Intellitype

Unlike a human teacher in a class of 30, this typing teacher can give each student immediate and extensive feedback. Because of this personalized attention, the user should progress more quickly than students in more traditional typing classes.

When a student enrolls in an *Intellitype* class the first time, the program requires some information (like name, age and date), so it can keep track of his or her progress. Each time that student signs on, his or her records (saved to a user created data disk) are accessed and the results of the current lesson are compared to previous lessons to help trace the user's progress. For those who aren't sure they want to commit themselves to an entire course (30 or 60 lessons) *Intellitype* offers a chance to simply browse and sample the type of lessons they will encounter. But once enrolled, like a regular teacher, the program keeps track of each student's progress, and with both text and graphs points out areas where the student excels as well as areas requiring improvement.

During each drill the program monitors and analyzes your keystrokes for 27 different types of errors in nine different categories. Once completed your progress is charted with different graphs which identify problem areas. The graphs reveal weaknesses in accuracy and speed. Once the program identifies a problem, it will create a unique tutorial (based on the analysis) which will help you improve. For instance, if during a class the program detects you have a tendency to transpose letters (e.g., type "thnig" instead of "thing"), it will prescribe a drill which will develop your skills typing those combinations of letters.

But beyond just telling the student about a problem and creating drills to help eradicate it, *Intellitype* pinpoints possible reasons for the problems and offers good advice on how to correct them. At first glance I was suspect of the program's claim to be able to do all that. But I became a believer after only my second class. The program identified and offered suggestions on how to correct a bad typing habit which has plagued me for years. I knew my typing speed slowed whenever I had to capitalize several letters in sequence, but I didn't know why. After only the second lesson *Intellitype* recognized the bad habit. According to the program I insist on using the left SHIFT key exclusively which is why I often fumble while trying to capitalize keys on the left side of the keyboard. Sensibly the program reminded me that every keyboard has two SHIFT keys and that I should use the right SHIFT key when capitalizing letters on the left side of the board.

Conclusion

Educational software, just like 90% of all classroom activities, is rarely fun (that's why most of us prefer spending our Saturday afternoons at the movies instead of geography class). The creators of both programs recognize this problem and have tried to inject as much fun into their programs as possible without diluting the tutorial's teaching ability. Both programs attempt and succeed in keeping the student's interest using different tricks: *Mavis Beacon* uses visual enhancements (an arcade game and ghost hands on the keyboard), while *Intellitype* keeps the user's attention by weaving the lessons around a soap opera-like storyline complete with car chases and foreign spies. And both fill out the teaching power of their product with plenty of colorful graphed analysis.

Both programs are easy to use, employ the mouse and pull-down menus where required, have practice and graded class activities and excellent user manuals. And unlike most real-life teachers, both let you structure your studies around your schedule and interest, but like their human counterparts both are quick to remind the student that it is practice that makes a better typist—not simply enrolling in a class. In short, if you don't complete the lessons and try to improve, you are just wasting your time—no pain, no gain.

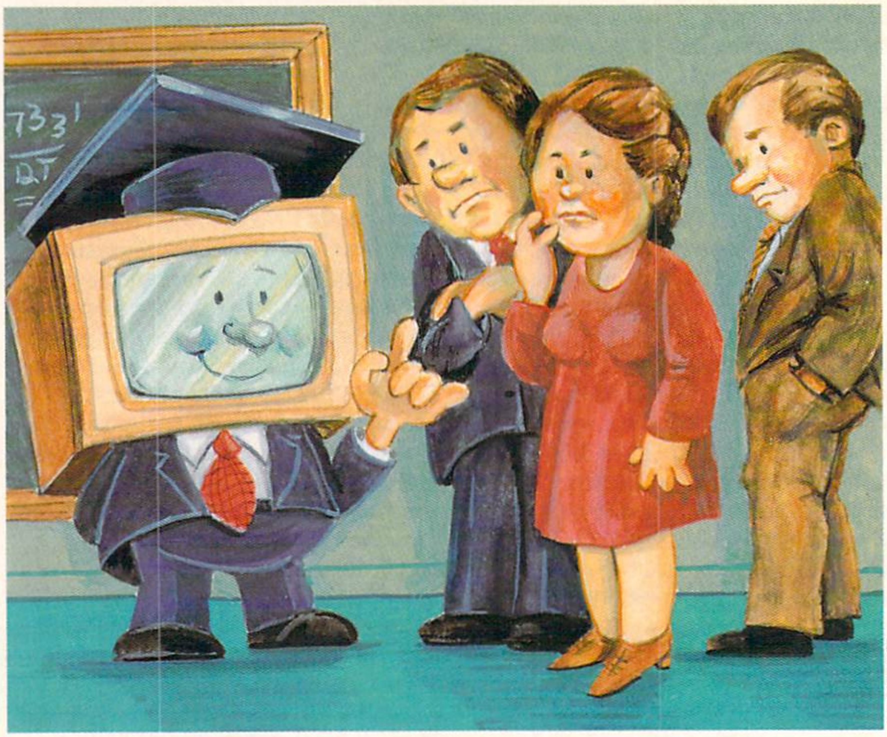
Regardless of which program you decide to use, your determination (as much as the program itself) will dictate how much your skills at the keyboard improve. Just like owning the best exercise bike cannot help you if you don't use it regularly, both of these programs are useless unless used consistently. I found both tutorials well designed and effective.

My personal preference is *Intellitype,* primarily because it approaches teaching more from an adult point of view, but I suspect younger students will prefer *Mavis Beacon* and her racing tutorial (although the program is being used at the Smithsonian, NASA and the IRS). I also had to give *Intellitype* some extra points because it is not copy protected. The *Mavis Beacon* disk never gave me any problems, but I always worried about it because each student's progress is stored on the original disk at the end of each session. Having had disks corrupted by write errors (which is very easily done if a power shortage occurs while the head is writing) I feel much more comfortable using a backup disk rather than the master program. ■

by Howard Millman

Computer Literacy Training for Educators

Who Teaches the Teachers?



In 1982, the Washington, D.C. school district convened a task force to determine how to best teach computer literacy to their students and administrators. One year later the district implemented their ambitious program. They forged ahead, predicting the program would adapt itself to technology's expected evolution.

Technology's progression proved not evolutionary but revolutionary. Looking back, would the district have been wiser to delay implementation? As one of the senior programs in the nation, what have they accomplished in six years?

We spoke with Jenelle Leonard, director of the district's Computer Literacy Training Lab. Jenelle, along with eight teaching assistants, operates this, the district's only computer training laboratory.

In a city better known for hindsight than foresight, Jenelle takes considerable pride in her facility, especially its seniority. "It's unusual for a school district to create a centralized training facility, especially one dating back to 1983. I don't think they (the task force) anticipated how fast the technology would grow. Yet, to their credit, they persisted and the lab was created."

The lab contains the same hardware and software as the district's classrooms. That includes LOGO, *Bank Street Writer* and programs created by Skills Bank, Broderbund, Learning Company and others. Hardware is a mix, comprised mostly of Commodore 64's, 128's and IBM computers. The lab also serves as the advisor for the district's hardware and instructional software purchases.

The school district has about 8000 computers for 87,000 students. Some fast math indicates that's about a 1 to 9 ratio, (but we all know the adage about statistics). That 8000 includes numerous administrative systems, so the overall average is closer to one computer per fifty students. (By comparison, the Federal Office of Technology Assessment's "Power On!" study reported a national average of one computer per 30 students).

The ratio, however is not consistent even within the district because the administration allocates a fixed number of computers per school. Since the student population varies from school to school, so does the ratio of students per computer.

In many of the schools special education students have a far greater need for computers, so they receive increased access time. Learning disabled students, for instance, average four students per computer. Jenelle sanctions that policy by pointing to the district's success with LD children. "Computers are non-judgmental," she explains. "Also, computers are tireless teachers, so they're ideal for the repetition many LD children need. Our software offers the student various levels of challenge and immediate feedback. That, in turn, motivates them. The learning disabled child experiences success more often using a computer."

Based on test scores, as well as on feedback received from teachers, she concludes, "The lab's overall success speaks for itself." To evaluate the progression and performance of mainstream students, the district uses the California Test for Basic Skills.

All instructors and administrators in the district are required to complete a 50-hour training course. Most meet this requirement by attending the lab's regularly-scheduled classes. In addition to the mandatory 50-hour course, the lab also offers 14 additional recertification courses in computer languages, dedicated applications (word processing, spreadsheets, databases) as well as specific aspects of using computers in the classroom. These follow-up courses fulfill the district's requirement for periodic recertification credits. Whether it be convenience or cost savings, teachers and administrators appreciate the basic and advanced training opportunities the lab provides.

The lab's main focus is to insure the uniform implementation of computer technology in grades K-12. Children are selectively introduced to computers in kindergarten. We asked Jenelle if that's a bit early for patterned introduction. "Children should be exposed to computers as early as possible, so they become familiar with the technology," she explained, adding, "as long as it's introduced gradually and gently."

The exposure gradually increases from kindergarten through grades one and two. The pace of exposure intensifies in the third grade.

The district's hardware and software purchases total about one million dollars annually for its 187 schools. Although that appears to be a comfortable budget, the reality is that it's still an all too limited resource. Jenelle's lab, for instance, faced with aging equipment or, more accurately, aging technology, takes the "path

of least resistance" and "keeps the equipment in service." After all, even if it's not the latest and greatest, it's still something.

Within the confines of their restricted budget, the lab offers as much exposure to computers as possible. Students wanting more keyboard time can take advantage of the district's innovative loan programs. The district reserves approximately 100 Commodore 64's for children to borrow and use at home.

Most of the borrowers are boys. Yet, Jenelle sees little difference between boys' and girls' innate abilities in relating to computers. She feels that the somewhat more aggressive boys tend to inhibit, to overshadow, the girls' interest. Therefore, what is perceived as girls' indifference to high technology is learned, not inborn. And this resignation starts early, fostered by competition in grade schools for the limited number of machines.

Jenelle's solution? She replies, "With the district's four-to-one female-to-male teacher ratio, technology-using females serve as role models for the girls." Changes in attitude take a long time to appear, but, she adds confidently, "it's mostly a matter of time."

In the nation's capital at least, time is eroding technology's gender-based elitism.

This month's software selection profiles a different kind of computer lab. We spotlight a high-quality low-cost chemistry simulation package from Simon & Schuster Software.

Chemlab

Computer: Commodore 64
Ages: 9–13 years
Publisher: Simon & Schuster, Inc.
1 Gulf + Western Plaza
New York, NY 10023
(800) 624-0023
(800) 624-0024 (in NJ)
Price: $19.95
Emphasis: Inductive thinking
Analytical and observation skills
Ordering a sequence

One of Murphy's nefarious laws says, "Of two possible events only the undesired one will occur." That (along with minimizing insurance premiums), is the reason all laboratory simulation software exists and undoubtedly the stimulus for Simon & Schuster's *Chemlab.*

Designed to satisfy a child's "what if" curiosity, *Chemlab*'s a safe and painless way to study the reactions resulting from mixing random chemicals. With more than 150 common and exotic chemicals available for the 50 difficulty-graded experiments, *Chemlab* could easily overwhelm students. But thanks to its uncomplicated manual, good graphics and ease of use, it achieves a unique blend of accuracy and entertainment.

Chemlab encourages junior chemists to obtain a "Target Substance." Most often, the student's assignment is to mix the correct chemicals in the proper proportions. Occasionally, experiments are designed to explore the use of the lab's equipment. Equipment consists of a beaker, flask, dryer, collector and condenser. Some experiments require heating, distilling or condensing the mixture to obtain the target substance.

All experiments take place in a chamber that looks like the inside of a fume hood. Across the top are containers dispensing solids and gasses. The chamber also contains twin robotic arms, one on each side of the screen, for moving equipment and mixing chemicals.

Both robot arms raise/lower, extend/retract and grasp/release. In most instances, single key presses switch the active arm, list equipment, heat or pressurize the chamber or control the dispensers. Another device, an elevator, supplies/returns equipment from the "basement."

Most experiments consist of mixing between three to seven chemicals. Some, usually not all, of the chemicals are required to produce the target substance. Since the formula for the target substance is supplied in the manual along with the formulas for all the component chemicals, the student must decide what combinations will produce the desired results. The other chemicals are available to satisfy the curiosity of inquisitive searching young minds or future demolition experts.

Reading like a list of props for *Mission Impossible,* the 50 target substances range from nitroglycerin, nitrous oxide, water, synthetic diamond, iron, antacids, rat poison and perfume. When mixed in the proper proportions, the desired target substance forms. Some mixtures are mildly or non-reactive when the wrong chemicals are combined. When students combine dynamically reactive chemicals, however, they "explode." When that occurs, there's no need to press "M" for an explanatory Reaction Message, the graphics say it all.

Effective note taking is part of the exercise. Sample forms are provided in the manual to accurately record mixtures and reactions.

Simon & Schuster are primarily book publishers, so it's reasonable to expect a well-written, well-organized instruction manual. And while they don't publish a great deal of software, the programs they do publish are usually first rate. In both cases, *Chemlab* conforms.

Low-Cost Computer Training Videotapes

The Computer Learning Foundation will soon be distributing a series of videotapes depicting the best ideas culled from their successful 1988 Computer Learning Month contests.

The (almost) professionally-produced tapes are made for airing on local Public Broadcasting Stations nationwide, as well as for classroom use. Viewers are encouraged to record these broadcasts and distribute copies to schools and libraries. If the tapes are not aired locally, you or your school can obtain copies, at a nominal cost ("nearly" free) directly from CLF.

The first tape, available now, outlines the program's goals and procedures and explains how teachers can participate in CLF-sponsored contests. Complete computer systems are some of the prizes waiting for teachers or parents who submit practical new ways of implementing computer technology in schools and homes.

Later tapes (the tentative production schedule is one per week) will contain fresh ideas and tested lesson plans submitted by teachers, educational professionals and others. Teachers will be able to integrate ideas from the tapes directly into the curriculum.

Broadcasts commenced in March. The CLF urges parents and teachers to ask their local Public Broadcasting Station to air the tapes.

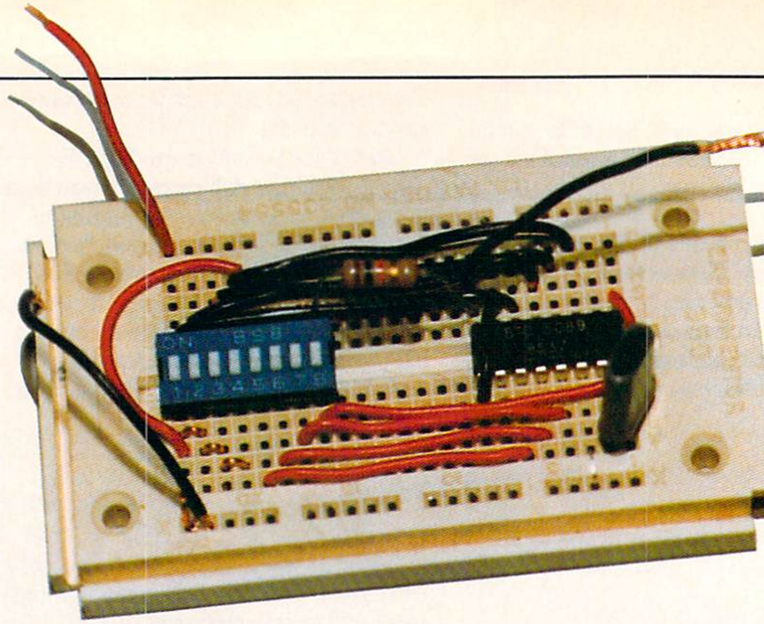
Send requests for videotapes and information to:

Computer Learning Foundation
P.O. Box 60007
Dept. CTM
Palo Alto, CA 94306-0007

Our next column will feature an interview with Sally Bowman, the CLF's dynamic director. Sally's the organic equivalent of a speeding freight train, and when it comes to successfully spreading the Foundation's message to parents and teachers, well, she holds to some unconventional ideas.

by John Iovine

Wireless Remote Control



This month we are going to examine the components to build a powerful remote control system. We will utilize chips designed and used by the telephone industry. These chips are capable of transmitting and identifying 16 standard signals. However, you won't be limited to 16 functions because those 16 frequencies can control thousands of remote operations.

In one application we will couple these chips to standard infrared components to build an infrared transmitter and receiver. The transmitter and receiver can be used to make a wireless joystick. But that is just one application.

DTMF

DTMF (Dual Tone Multi-Frequency) was originally developed by Bell Telephone just over 20 years ago. This was before the U.S. government forced Bell Telephone to break up thereby enabling it to expand into other markets. DTMF may be more familiar to you as Tone dialing or Touch-Tone™ dialing.

The standard DTMF signal is composed of two audio tones generated from a group of eight possible tone frequencies. The eight frequencies are divided equally into two groups, a low frequency group and a high frequency group. The DTMF signal is an algebraic sum of two tone frequencies, one tone from each frequency group. (See photos 1, 2 and 3.) If we do the math ($4 \times 4 = 16$) we see that we have 16 possible combinations.

Low Frequency Group		
Pin #	Row #	Frequency
R1	Row 0	697 Hz
R2	Row 1	770 Hz
R3	Row 2	852 Hz
R4	Row 3	941 Hz
High Frequency Group		
Pin #	Column #	Frequency
C1	Column 0	1209 Hz
C2	Column 1	1336 Hz
C3	Column 2	1477 Hz
C4	Column 3	1633 Hz

Table 1

The low frequencies (R1 = R4) are referred to as the row group; the high frequencies (C1–C4) as the column group. (See table 1.)

DTMF Encoding

Any combination of frequencies can be obtained using a 4×4 matrix switch keypad. (See figure 1.) Remember we are borrowing this technology from the telephone industry; it's been designed for optimum efficiency with that equipment.

Signal		Frequency (Hz)	
Decimal	Binary	Low	High
1	0001	697	1209
2	0010	697	1336
3	0011	697	1477
4	0100	770	1209
5	0101	770	1336
6	0110	770	1477
7	0111	852	1209
8	1000	852	1336
9	1001	852	1477
0	1010	941	1336
*	1011	941	1209
#	1100	941	1477
A	1101	697	1633
B	1110	770	1633
C	1111	852	1633
D	0000	941	1633

Decimal signal is key pressed on matrix.
Binary Signal is output Q1-Q4 on receiver.

Table 2. DTMF to Binary Decoding.

Standard Touch-Tone phones use only a 3×4 keypad matrix. This matrix provides coding of all the row frequencies and three column frequencies.

To build an encoder is really quite simple. (See figure 3.) A single IC chip, the STC 5089 (See figure 2) with a 3.57 MHz color burst crystal provides the DTMF signal. Although the circuit in figure 3 shows a 4×4 matrix, you can simply ground any row and column pin to generate a DTMF signal. (See table 2.)

Figure 4 is an encoder test circuit using an eight-position dip switch. The dip switch takes the place of the matrix keypad, with it you can test the operation of this circuit and also the DTMF receiver. Notice when you turn a switch on, you are grounding the pin it is connected to. The pins R1 through R4 and C1 through C4 are active low. I wired switches 1 through 4 to pins R1 through R4 and switches 5 through 8 to pins C1 through C4.

Single tones can also be generated. Single tones are usually generated for testing purposes. Let's suppose you wanted to generate a 1336 Hz sound equivalent to the C2 pin. Ground any two row pins and ground the C2 pin. This will generate the 1336 Hz signal. You can also do the same with the row frequencies, by grounding any two column pins with the particular row frequency pin you desire. (See photos 1, 2 and 3.)

DTMF Decoding

DTMF decoding is only slightly more complex than encoding. Again the simplicity results from a single IC chip, the G8870 (See figure 2), doing most of the work. Again the chip uses a 3.57 MHz crystal that provides the on-chip oscillator with a crystal generated reference frequency.

The decoding chip provides a four-bit latched output, labeled Q1 through Q4. (Q4 is the MSB—Most Significant Bit.) The current output of Q1 through Q4 isn't sufficient to light any LED's. But we can get around this by using the outputs as a ground and tying the LED's to +5 volts. This lets us sink enough current to light the LED's. (See figure 5). This feature

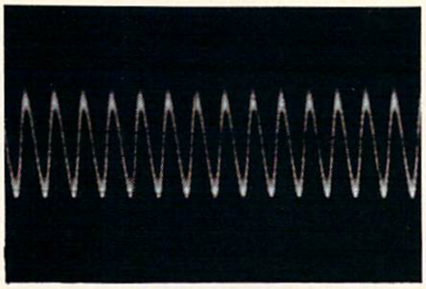


Photo 1. R1 frequency 697 Hz.

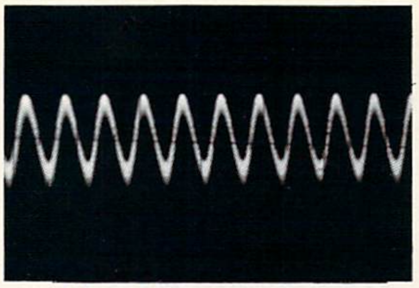


Photo 2. C1 frequency 1209 Hz.

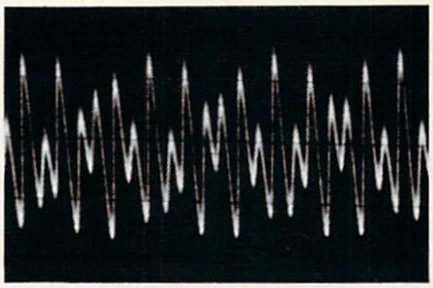


Photo 3. DTMF Signal C1 and R1.

would also work very well with the joystick pins, which are active low.

The output on Q1 through Q4 is a binary number. By looking at table 2, you can determine the binary output that will be displayed on Q1–Q4, for all the DTMF signals. The way the circuit is wired, the binary 0's will light the LED's.

Next Month

I advise you to experiment with these chips. It shouldn't take you more than ten minutes to breadboard the testing circuits. Connect a wire from the tone out on the encoder circuit to the tone in on the decoder. Try the various combinations of DTMF signals you can generate with the eight-pin dip switch, and observe the output on the receiver. These chips are easy to work with and are very versatile.

Next month we will concentrate on applications. We will use these chips to make an infrared wireless joystick. In addition, we'll make a few other interesting computer-controlled projects.

Figure 2. DTMF Decoder and DTMF Encoder.

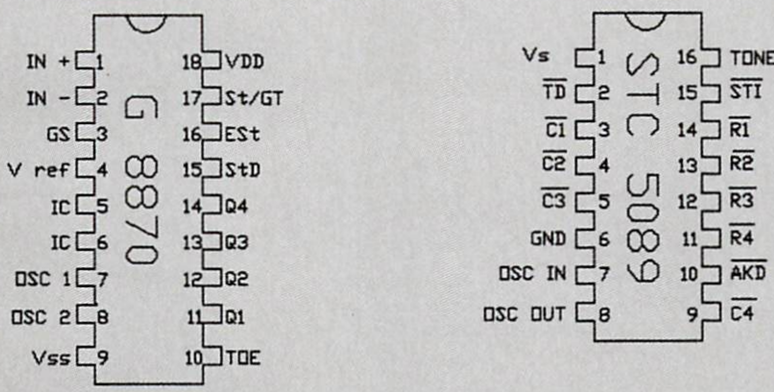
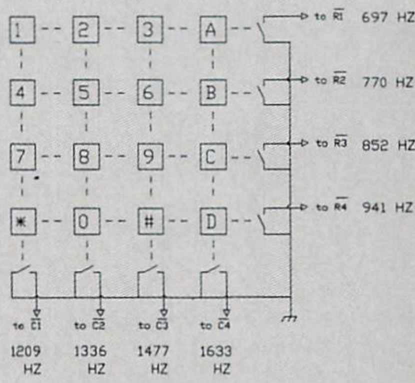


Figure 1. Matrix 4×4 Keypad.



Pin out of G8870 DTMF Integrated Receiver

PIN #	Name	Function
1	IN+	Non-inverting Input
2	IN-	Inverting Input
3	GS	Gain Select
4	Vref	Reference voltage
5	IC	Internal connection
6	IC	Internal connection
7	OSC1	Clock input
8	OSC2	Clock input
9	Vss	Ground
10	TOE	Tri-state enable output
11	Q1	Output
12	Q2	Output
13	Q3	Output
14	Q4	Output
15	StD	Delayed steering output
16	ESt	Early steering output
17	St/GT	Steering input/guard time
18	VDD	Supply Voltage

Pin Out of STC 5089 DTMF Frequency Generator

Pin #	Name	Function
1	VB	Supply Voltage (2.5 V to 10 V)
2	*TB	Tone disable
3	*C1	Column input
4	*C2	Column input
5	*C3	Column input
6	GND	Ground
7	OSC1	Clock input
8	OSC2	Clock input
9	*C4	Column input
10	*AKD	Any Key Down output
11	*R4	Row input
12	*R3	Row input
13	*R2	Row input
14	*R1	Row input
15	*STI	Single tone inhibit input
16	Tone O/P	DTMF output

**Active Low*

Parts List

IC1	G8870 DTMF Receiver
IC2	STC 5089 DTMF Generator

Cost: $20/set
Order from: Images Co., P.O. Box 313, Jamaica, NY 11419

8-position dip switch	#275-1301
3.57 MHz Xtal	#272-1310
Proto-type breadboard	#276-175

Part Numbers: Radio Shack

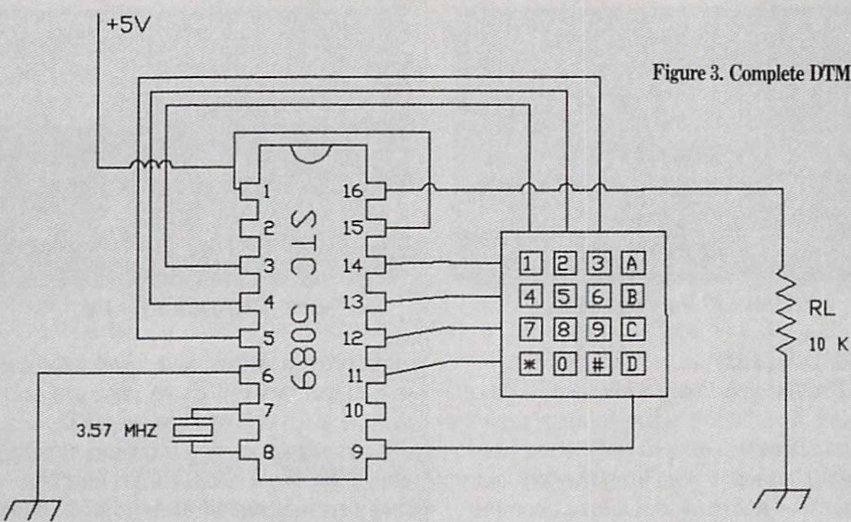


Figure 3. Complete DTMF Encoder.

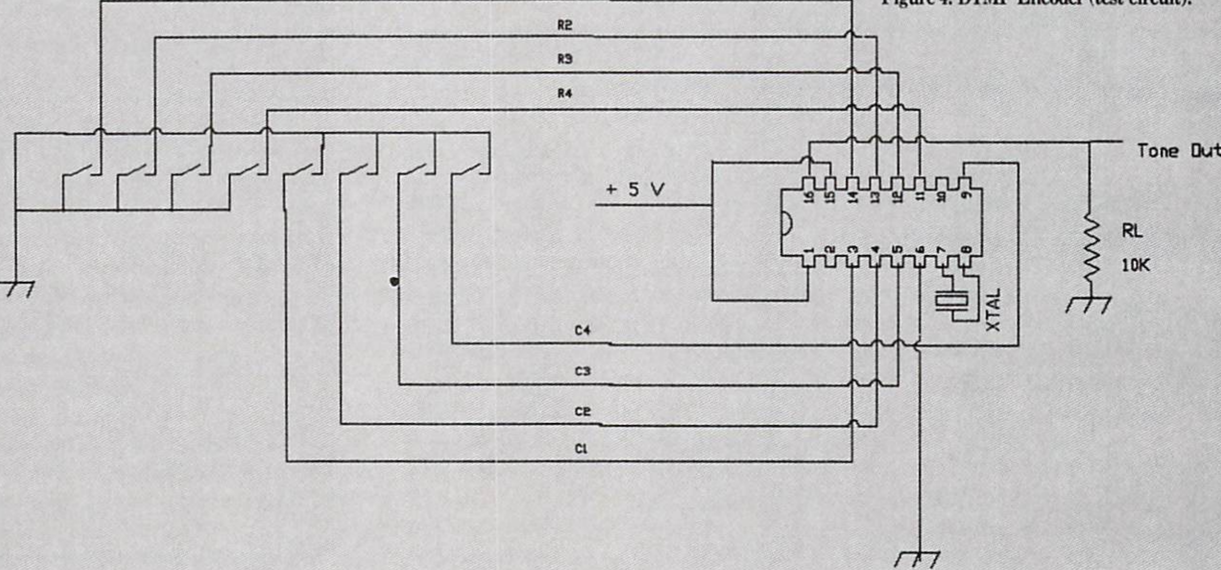


Figure 4. DTMF Encoder (test circuit).

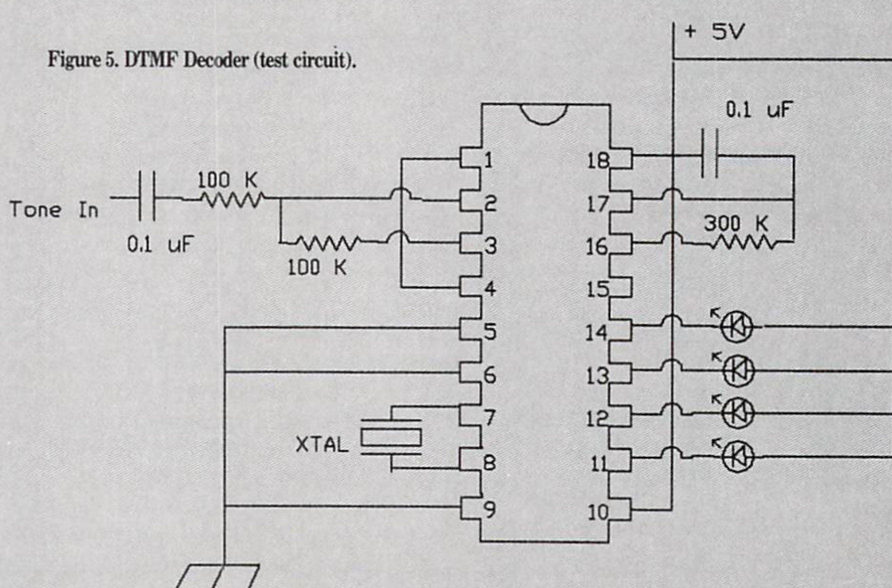


Figure 5. DTMF Decoder (test circuit).

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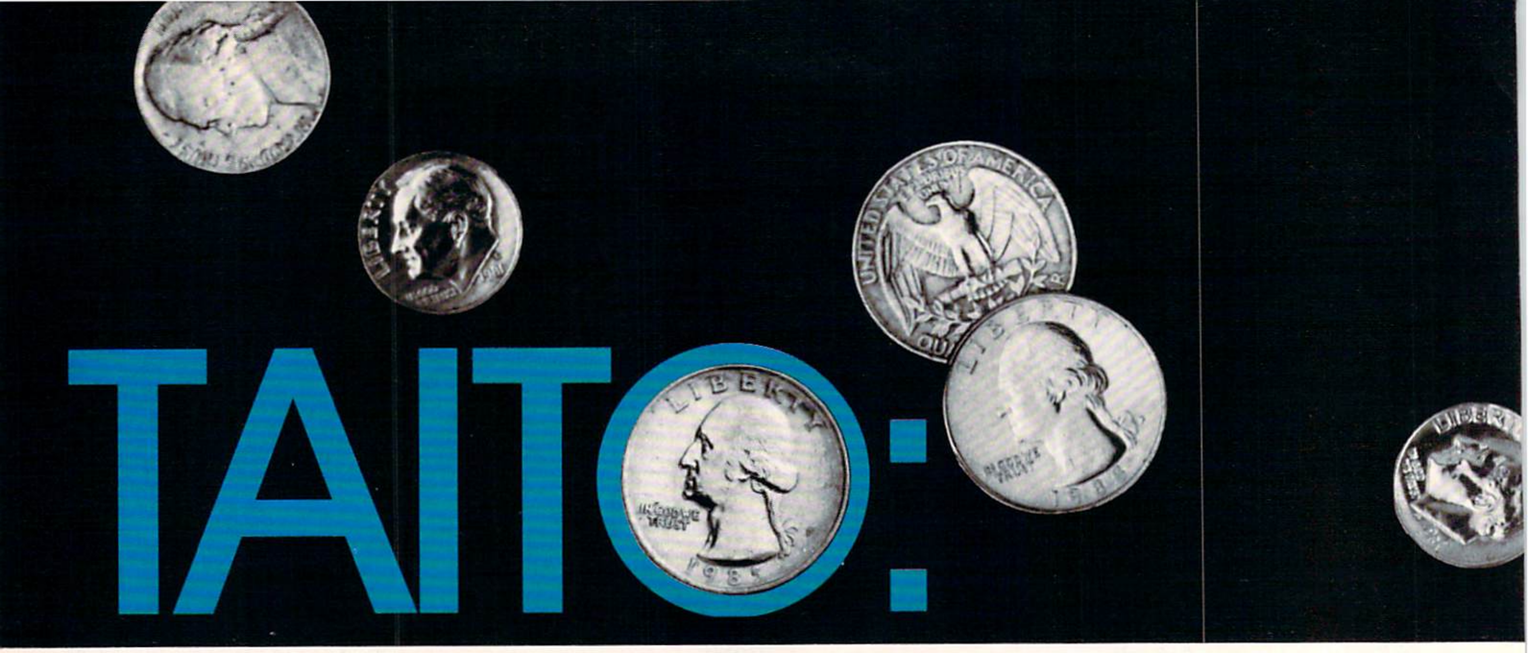
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TAITO: THE ARCADE LEADER BRINGS IT HOME

by Russ Ceccola

Taito, the Japanese coin-op arcade giant, is now marketing home computer software for Commodore computers (Amiga versions soon to follow). We turned Russ Ceccola loose on a roomful of Taito's coin-op hits with a few rolls of quarters, and then let him play-test the Commodore 64 versions. Here are his blow-by-blow observations and ratings.

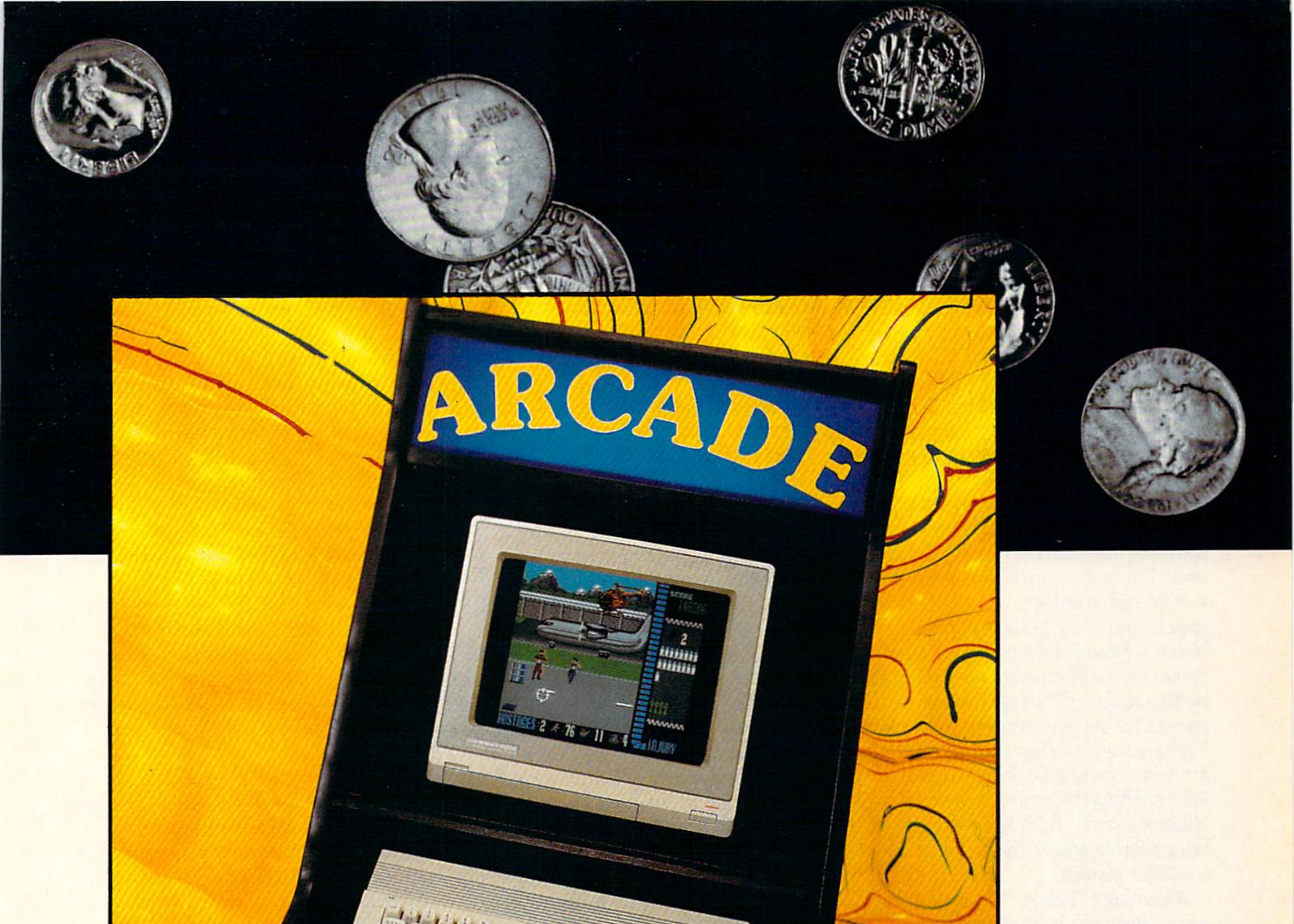


Alan K. Fetzer, President of Taito Software, Inc.

Anybody who knows anything about arcades should recognize the name Taito (pronounced "TIE-toh"). Taito is, of course, the largest operator of arcade parlors and the largest developer and manufacturer of coin-operated arcade games. Founded in 1953, Taito Corporation has been a constant force in the arcade business. Their 1988 statistics of $500 million in worldwide sales, 110 offices throughout Japan alone and 100,000 arcade machines in operation worldwide indicate their stature in the industry. For those of you still in the dark, does *Space Invaders* ring a bell?

In 1978, Taito developed and placed in arcades everywhere this popular coin-op machine that revolutionized the industry and paved the way for shoot-'em-ups, space games, stand-up arcade machines (other than pinball and Pong-types) and all the other games that would follow in the next decade. *Space Invaders* was the first major arcade hit. I can still remember the day I walked into an arcade to find a full row of *Space Invaders* machines next the same old familiar machines. One play and I was hooked.

Since that day, games have become more complex, tastes have gotten more critical and arcades more selective. You can't find *Space Invaders* in arcades anymore, but you can certainly find the Taito name emblazoned on many more games.





Taito games room contains all commonly used personal computers. Products are vigorously tested here prior to release.

CHARLES BARTHOLOMEW

Taito was the first to really capitalize on the arcade business in Japan back in the '50's. From that point forward, Taito game parlors sprang up all over Japan, and the number of games appearing from Taito increased with the company's reputation.

Alan Fetzer, president of Taito Software, Inc. told me in a recent interview, "The mammoth operation that we have in Japan has really enabled us to invest a lot in developing our own games and also to obtain games from other small subcontractors across Japan." Clearly, Taito is riding the wave of their success from the early days of arcades, but now the company has much more competition at the front of the pack.

To augment their strong presence in the arcades of the world, Taito entered the home software market in 1988. Taito Software, Inc. (a division of Taito America) was formed in order to bring Taito-developed games to the home computer arena. Initially, Taito Software, Inc. released games for the Nintendo Entertainment System as one of the first third-party licensees for the game system. Taito's first NES games were *Legend of Kage, Elevator Action, Bubble Bobble* and *Renegade*. After making themselves known in the Nintendo world, Taito Software decided to bring their talents to the rest of the home computer gamers.

According to Fetzer, "Clearly a part of our strategy has been to get into the computer software business. That's what Taito Software, Inc. is set up and charged to do. Coming out of the starting gate, we think we've done a pretty good job getting our games quickly into the national distribution channels and selling lots of them."

Taito Software, Inc. released their initial computer games on the Commodore 64 and quickly converted them to other home computer systems. The first five Taito games for the 64 were *A.L.C.O.N., Arkanoid, Bubble Bobble, Renegade* and *Rastan*; *Operation Wolf* followed those shortly.

When I first saw the ad for the home computer versions of the Taito arcade hits (as all of the releases are), I decided that it might be interesting to compare each game blow by blow to their arcade predecessors—hence this article. After contacting Taito and playing both versions of the games, I have high praise for their work. But before I rate the games, I'd like to relate some of Fetzer's views of Commodore computers and the software.

Since the Amiga is generally recognized as the best arcade game machine available, I had hoped that Taito might develop games exclusively for 16-bit machines like the Amiga that would never see the light of day in the arcade. But Fetzer made a good point when he said, "The arcade game developers are able to build the hardware capability for sophisticated graphics and sound directly into the hardware of the [coin-op] arcade machine, and they like to maintain an edge over what's available in the home market—the idea being that if you can play it at home then there's less motivation to go into the arcade."

Although reluctant to use 16-bit machines as the base for specially-developed games, Fetzer understands the importance of those computers and is dedicated to bringing the best that is possible to them.

Commenting on Commodore computers, Fetzer revealed his opinion, "With new machines like the 16-bit Sega and Nintendo systems being introduced in America in the next few years, as well as with the presence of the 16-bit computers that already exist, we see the Commodore 64 eventually fading away, so that there won't be much eight-bit gaming left, although the support for that installed base will continue." I share his opinion, but am also optimistic for the future. Fetzer continued: "Although this may happen, the work done on the 16-bit computers will be incredible. The graphics in the Amiga versions of our games are virtually identical to the original arcade machine artwork, and we port the same data over from the coin-machine graphics files to the Amiga files."

Unfortunately, I didn't get to see the Amiga versions of any of the Taito games before this article was written. However, the 64 versions were for the most part very good and captured the spirit of the original games.

Fetzer explained their conversion process: "On some of the games (like *Arkanoid* or *Bubble Bobble)*, moving the graphics from the arcade to the 64 really isn't that much of a problem because the original arcade graphics aren't that challenging. On a game like *Rastan*, what we generally do is reduce the amount of data required for the graphics image, and we step up the side of the program that is related to game play. The conversion of a game like *Rastan* or *Operation Wolf* can take up to six months, with a three-man team working on it full time. There's always a time period of fine-tuning (one to two months) when the conversion is finished, and we have game testers in-house and out-of-house run the game through a rather vigorous testing process."

Overall, I think the results are pretty good. I've been both an arcade fan and Taito fan from the early days of the arcade games' popularity and can honestly say that I wanted to play these 64 conversions of their arcade counterparts again and again.

In order to accurately rate these games, I've developed a system to help you decide which conversions are the best of the bunch and whether any particular game is an accurate translation to the Commodore 64. I've assigned a score from one and ten for each of three categories that I think fully describe an arcade game: Graphics, Music and Sound Effects and Game Play. Combining these three categories gives an overall rating, with Graphics worth 25% of the final score, Music and Sound Effects worth 25% and Game Play worth 50%. The ratings are indicated after the description of each game.

You might ask how I can compare the



Operation Wolf



Operation Wolf

graphics from an arcade machine to the 64; the answer is that it's impossible to do such a thing. What I have done is compared the 64 versions to the arcade game keeping in mind the capabilities of the 64. If a sound effect is possible on the 64, it better be in the game, or the rating is reduced. This applies to each of the categories, with Game Play the most important, since a game can have terrible graphics but still be fun to play.

In any case, you can take my rating system as the final word, or flush my whole article down the toilet and try the games out yourself. The final choice is up to you. However, you should know that before I played the home version and reviewed each of the six games, I played at least five dollars' worth of quarters in the arcade machine to refresh my memory of the original game.

Fetzer reflected my overall opinion of the games and Taito's work spent on the conversions when he said, "Since we're new to the business and we're coming into what might be described as a rapidly maturing business, we've put a real emphasis on quality. We're really trying to put out products for which the consumer will feel like he got his money's worth. We know that some of our competitors have rushed to get a product out. We've done the opposite, and in fact, that's why all of our Amiga products are late—because we're being real careful about what we put out on the market."

A.L.C.O.N.

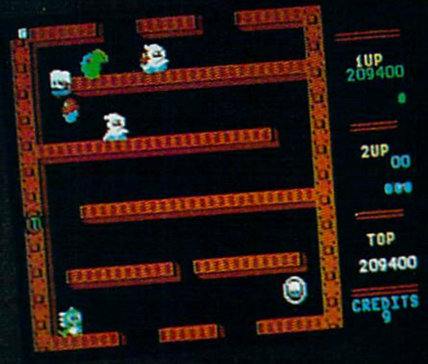
A.L.C.O.N. is a space game shoot-'em-up that ranks with the best of them. You are chosen by the Allied League of Cosmic Nations to pilot a special experimental SW475 Starfighter against a group of aliens that has taken over your planet. The controls are simple to use, yet difficult to master.

Unfortunately, Taito has found that some people think that the game is too difficult to win. Fetzer said, "The problem is just that the game is somewhat difficult. When an average-ability player starts to play the game, he can't make it very far and gives up." This is partly true. The difficulty with *A.L.C.O.N.* is that you have to react very quickly to what happens in the game. Once you know what you are doing, the rest is just an exercise in skill. *A.L.C.O.N.* is a vertically-scrolling game that has the action scrolling over the planet you are protecting. You must shoot aliens as you come across them with the fire button on the joystick. Good aim is important.

Sky Shark is another of the Taito arcade hits planned for home conversion. Fetzer said, "The same type of programming is used to move large amounts of screen data and, at the same time, have game play across that screen." If this similarity is a good indication of what *Sky Shark* will be like, I know I'll like the game.

The real beauty of *A.L.C.O.N.* lies in the ability to change Starfighter formations and weapons. Herein also lies the strategy in the game. When you hit certain aliens, they leave behind yellow stars. By flying over the star, you collect it and one of several boxes at the bottom of the screen turns yellow. By pressing the space bar, you gain the power in the highlighted box. The trick is that you have to highlight the boxes in order from left to right. These boxes are Speed, Shot, Side, Wing, Bomb, Lazer, H. Miss and Shield. The first five times you fly over stars, the Speed box will light. After pressing the space bar, your speed increases. This is necessary to play *A.L.C.O.N.* A slow ship is hard to maneuver. After increasing speed, it takes only one collected star to highlight the next box on the right. Each star collected advances the highlighted box to the right. By collecting a certain number of stars, you can get more powerful weapons (press the space bar when the box for that weapon is highlighted).

Shot returns your fire to normal, Side allows shots from the side of your ship, Wing increases the size of your ship, Bomb allows targeting of explosions in front of you, Lazer gives laser fire, H. Miss sends homing missiles to kill each alien on the screen at the same time, and Shield makes you impossible to kill for a few short seconds. Each weapon/formation has its purpose and, after experimenting, you'll find which situations in the game require them.



Bubble Bobble

With *A.L.C.O.N.*, you can choose music, effects or both (a nice touch) and the animation is very smooth. I was very happy with the translation, and my only regret is that you have to hit the space bar for formation changes (sometimes you are far from the keyboard).

Ratings:

Graphics:	8.00
Music and Sound Effects:	8.00
Game Play:	9.00
Overall Rating:	8.50

Arkanoid

Arkanoid is the popular coin-op that picks up where *Breakout* left off. You control a paddle to bounce balls off of multi-colored bricks in order to clear the current game screen of bricks. The story line goes like this: Your paddle is a Vaus space craft that you use to bounce energy balls off of the energy barriers that prevent your further travel in space. Aliens descend to get in your way, and the bricks have varying properties. Eventually, you get to bounce the ball off of the enemy that holds you captive and requires that you break through the barriers. This is on the last level.

Certain blocks spawn special lettered and colored capsules that help you in your battle. These capsules are the element of the game that made it so popular. You must position your Vaus craft below the falling capsule so that it falls on you to collect the power within the capsule. B capsules open a section in the right wall and allow immediate escape to the next level; C capsules let you catch the ball; position it and release it wherever you want within your movement space; D's divide the ball into three balls for greater block

Continued on page 81



Arkanoid

COMING ATTRACTIONS

by John Jermaine

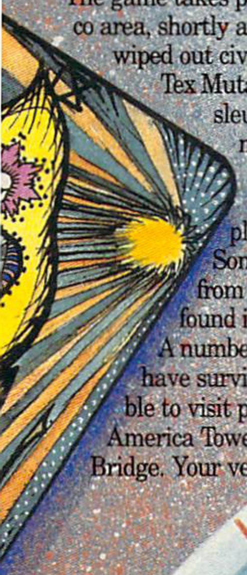


I looked out my window this morning and saw the first buds on the trees. Spring is definitely in the air. Before you know it, we'll see flocks of geese flying north, and home computers will be abandoned in favor of warm-weather activities. But I'm not going to let you do that. In fact, this feature will entice you to faithfully man the keyboard throughout the warmer months. So don't put this incredible magazine down, or you'll miss out on all the fun.

Access Software

64: Would you like to know the best-kept secret at Access Software these days? Let me introduce you to "Tex Mutant: Detective of The Post Nuclear Age." That's the working title of their new project (slated to hit the market sometime this spring).

Welcome to the twenty-first century. The game takes place in the San Francisco area, shortly after a nuclear war has wiped out civilization as we know it. Tex Mutant is a brilliant young sleuth in this post-war mess. He picks up clues at different locations and tries to solve a perplexing murder mystery. Some of the clues are objects from the 1980's and can be found in bars, cheap hotels, etc. A number of Bay Area landmarks have survived the war, so it's possible to visit places like the Trans America Tower and the Golden Gate Bridge. Your vehicle is sort of a futuristic Dodge. You can fly it to any location on the map which displays a large portion of the San Francisco area. By the way, you won't find aliens in this futuristic world, but some of the citizens have mutated a bit due to the effects of radiation.





An Access executive also told me the product was designed to accept additional disks. He went on to say that optional "murder scenery diskettes" are already in the works. Chicago and New York City were mentioned as possible sites for new adventures. "Tex Mutant" is interactive fiction, flight simulator and role-playing game all rolled into one. It should be a big seller this year.

Hunting a killer in San Francisco is one thing. Blasting the hide off alien conquerors is another matter altogether. There's no place to hide on Earth these days, so you join the resistance for a final stand against your foes. "Alien Scumbags from Outer Space" is the code name for another new Access project. The program is basically a shoot-the-aliens arcade game, where you drive your vehicle to a large building and conduct a search of the premises. This structure contains over 100 screens that are loaded with alien activity.

"Alien Scumbags" also contains an artificial intelligence factor that evaluates your performance and tailors the level of game play to the individual. In other words, a six-year-old can play the program just as competitively as a seasoned pro.

You can even play the game in one- or two-player mode. When two users participate, they work together to crush a common enemy. The program will probably be modem compatible. If that happens, a 64 user will be able to play "Alien Scumbags" with an Amiga user (or anyone else who owns the program). Although the decision on this matter hasn't been made yet, I believe we're witnessing the birth of the first modem arcade game. My spy at Access also informs me that they may be working on a sequel to the project, which will feature a game construction set. Look for this exciting product later this spring.

One last note: Doug Vandegrift, the project artist, recently received an Emmy for his work on a *Muppet Babies* episode. Congratulations, Doug! I hope your artwork on the "Alien Scumbags" project is just as impressive.

Amiga: "Tex Mutant" for the Amiga should be shipping a few weeks after the 64 version makes its debut. An Amiga version of "Alien Scumbags" is also being developed, but a release date hasn't been announced.

Capcom

64: *Forbidden Worlds* (mentioned in an earlier "Coming Attractions") is an incredible shoot-'em-up arcade game. You explore the depths of outer space, blasting every adversary that approaches your position. You're also collecting special coins that allow you to purchase numerous powers and weapons. There are 20 different weapons to choose from in the program. It pays to know the firepower of each device, and what it was designed to incinerate. Look for this futuristic search and destroy mission sometime in April.

Last Duel, another outer space assignment, is also slated to come out in April. It's another program in which two users can play the game simultaneously, or you can take on the entire enemy force by yourself. *Last Duel* is similar to Capcom's *Side Arms* game, but the graphics are better and the characters are different. When all is said and done, the program gives your hand, eyes and brain a real workout.

If you're addicted to action arcade games, *LED Storm* should be right up your alley. This is another program that one person can play, or two people can participate simultaneously. In the two-player mode, one user assumes the role of an airplane, while the other becomes an automobile. The aircraft has to deal with things like bombers, supersonic fighters, missiles, etc. On the ground, you have to worry about sophisticated tanks, mine fields and other threats to your health. *LED Storm* has action galore, and it will attempt to blow away the competition sometime in April.



MIA BOSNA

Ghouls and Ghosts, the sequel to *Ghosts and Goblins,* is another spring release. Once again, an evil demon has captured the princess and taken her off to his lair. You, on the other hand, are a brave young knight setting off on a quest to rescue her. Your journey will take you through savage lands, where mystic forces and hostile life forms reign supreme. There are many weapons to choose from in the game, but your mind is sometimes mightier than the sword. The program also contains superior graphics and an interesting storyline. If you liked *Ghosts and Goblins,* I'm sure you'll love *Ghouls and Ghosts.*

Last, but not least, we need to talk about *Strider.* Have you heard the old expression, "You can't change the spots on a leopard"? In the year 2050, the Russians have finally conquered the world. The mysterious Grand Master runs things from Moscow, and you're going in there to put him out of business. I like the main character of the game because he can jump, cut, scramble and even fly. Your weapon is a special sword featuring a blade made of pure energy. Your enemies include packs of wolves, KGB agents, Soviet soldiers who can fire at you or use their bayonets, flying assassins, etc. Players fight off enemy forces in the snow-covered mountains of Siberia and slug it out with natives in lowland jungles. *Strider* contains a little bit of everything, and I believe it's destined to be a hit.

Amiga: All of the 64 titles mentioned above will be released for the Amiga at about the same time.

Cinemaware Corporation

Amiga: I've waited six months to tell you about *It Came From the Desert.* This unusual program is a visual tribute to the big bug movies of the 1950's; I'm sure you remember films like *Them* and *Mantis.* As the game begins, you play a scientist in a tiny desert town called Lizard Breath. All the familiar movie characters are living in your community: there's the nosy reporter, the easygoing police chief, your girlfriend (who works at the local radio station), and even a national guard unit stationed nearby. Nothing ever happens in this isolated community—until today, that is. Buildings are collapsing for no apparent reason, portions of the town have become radioactive, and people are disappearing at an alarming rate.

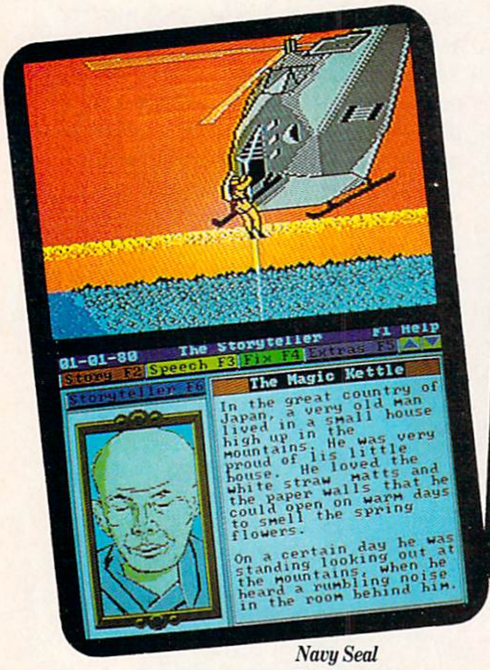
Your job is to determine what is out there, warn the townspeople of the impending danger and get them to help you destroy the colossal monsters (whatever they are). Giant ants are often the culprits, but two other types of mutated creatures also appear in the game (I won't tell you what they are). It's interesting to note that one type of monster, or a combination of several types, can be responsible for the death and destruction. Everything happens in real time, and I hear the creature graphics and sounds are absolutely fantastic. Bob Jacob, president of Cinemaware, shared an interesting secret about the game: it has the ability to accept optional disks. This means we may see new "Creature" disks in the near future. *It Came From the Desert* is a three-disk project, with release projected for mid-May.

Coming Later in '89: If you enjoyed *TV Sports Football* on the Amiga, I'm sure you'll fall in love with *TV Sports Basketball* (scheduled for release in the fall). It's a true five-on-five basketball program featuring everything you expect to see and hear at a professional basketball game. Watch the cheerleaders do their stuff, see the famous "chicken" strutting around, and prepare yourself for a number of neat surprises. *TV Sports Basketball* also contains complete league statistics. Jacob commented, "We think this TV Sports metaphor will continue to be important to us in the near future." I guess that's his way of saying we haven't seen the last of the TV Sports line.

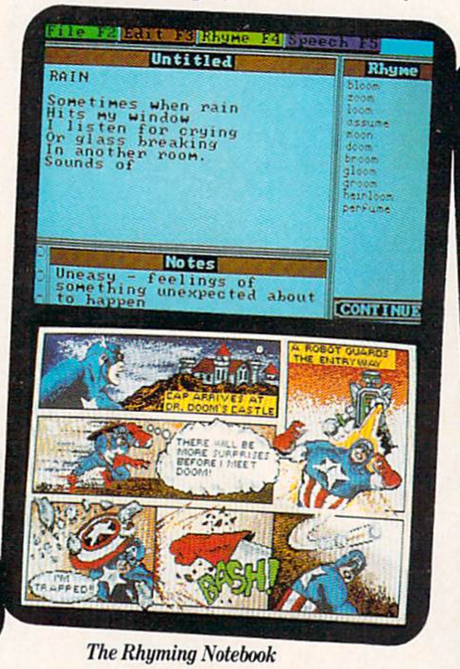
During the holiday season, Cinemaware will unveil its latest creation, an interactive movie featuring incredible 3D graphics. This program is also a sophisticated flight simulator with a number of dangerous missions to perform. I can't tell you the subject matter of the project, but (HINT) you see a lot of this type of material on television these days.

Cosmi

64: August is an important month on your Cosmi calendar. First of all, we have *Super Huey Stealth: Assignment Nicaragua.* Yes, you're about to fly the world's first stealth helicopter. But flying this state-of-the-art marvel is only one of your problems. A very important ambassador in Central America has been kidnapped by a local kingpin's thugs. They're holding him hostage at the center of their drug operation to keep U.S. forces at bay. No one is



Navy Seal
The Storyteller



The Rhyming Notebook
Dr. Doom's Revenge



Keith Van Eron's Soccer
Destroyer Escort

attempting to rescue the man, so you offer to fly in and decimate the place. Unfortunately, the United States government says no to your proposal. Your top-secret helicopter must not fall into enemy hands. So you simply "borrow" the craft for the adventure of a lifetime.

Once in the air, you must evade all U.S. attempts to ground your aircraft. Then you have to worry about military forces in foreign lands. They don't know what you're doing there, so expect them to treat you like an invader. After reaching your destination, you set the chopper down and go off on foot. There's an army of military types in the area, so it pays to be careful. Rescuing the diplomat is important, but you might as well destroy the drug empire since you're already there. Then you have to get your helicopter home, taking full advantage of its stealth technology.

Super Huey Stealth promises to be a very special project because Paul Norman is developing it. You may not recognize the name, but I'm sure you've heard of his games (*Super Huey I & II, The President is Missing,* etc.).

Nuclear Numchucks is another title scheduled for an August release. In the opening scenes of the program, a mysterious character beats you up. Surviving this ordeal, you set off on a mission to master classic Ninja weapons. These include throwing stars, single-blade swords and bamboo poles, among others. Lessons consist of "on-the-job training" because someone is always trying to put you out of commission. Along the way, you discover your foe is actually an android. Your weapons will still work against the rogue, but you now need access to a super weapon: the legendary nuclear numchucks. The game also features superb arcade action, interesting sounds and a series of visual rewards.

Amiga: To quote an expert on the subject, "They're the toughest men alive!" No, I'm not talking about the IRS (who took me to the cleaners last month). It's the Navy Seals, an elite branch of the military. These underwater specialists can parachute into an area, scuba-dive to a certain point and set charges to blow up a structure. They're also experts at hand-to-hand combat. *Navy Seal* contains four exciting scenarios, multiple levels of difficulty, realistic sound effects and smooth-scrolling graphics. I wonder if they could get the IRS off my back? Wouldn't that be a great American adventure? If government employees are reading this, I'm only kidding, guys!

Data East USA

64: *Heavy Barrel,* the popular coin-op arcade machine, is scheduled for shipment in May. An underground nuclear missile site has been taken over by terrorists. Your job is simple—eliminate enemy forces before they can launch the missiles. This means you will have to neutralize tanks, navigate treacherous waterways, and liberate bridges on this suicide mission. But you do have an advantage here. The enemy doesn't know about "Heavy Barrel," the most powerful weapon ever made. It was recently dismantled, and the



pieces were placed inside six lockers within the installation. So you have to search for keys, find the lockers, open them up and assemble your gun without being detected. Then it's time to make your presence known. If you have nerves of steel and a fast trigger finger, *Heavy Barrel* is the game for you.

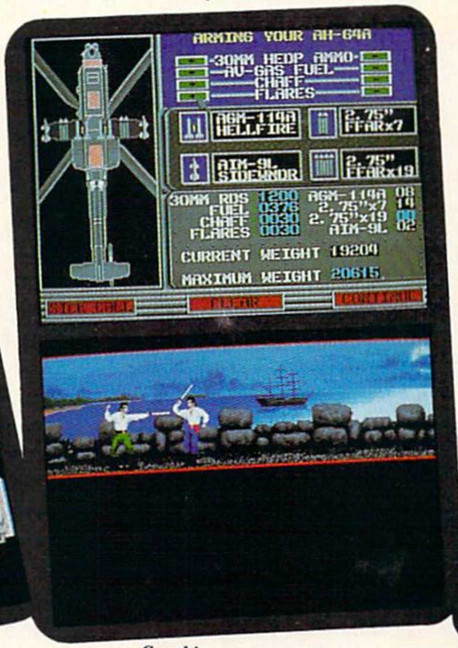
Bikers, take notice: *Super Hang-On* is projected to hit the market by mid summer. No, you don't have to beat up rival gang members or run them off the road. Points are awarded for overall driving performance, distance, speed and course completion. A course builder can also be found on the disk. It allows you to create your own motorcycle race course—lay out your own hills, straightaways and curves. I haven't actually seen this product, but it sounds like a lot of good clean fun.

Amiga: What's part human and part machine, carries a lot of firepower and already has the competition sweating nickels? Why it's *Robocop,* of course. Old Detroit is full of corruption, and you're going in there to clean things up. Robocop battles the forces of evil on the back streets of

Continued on page 84



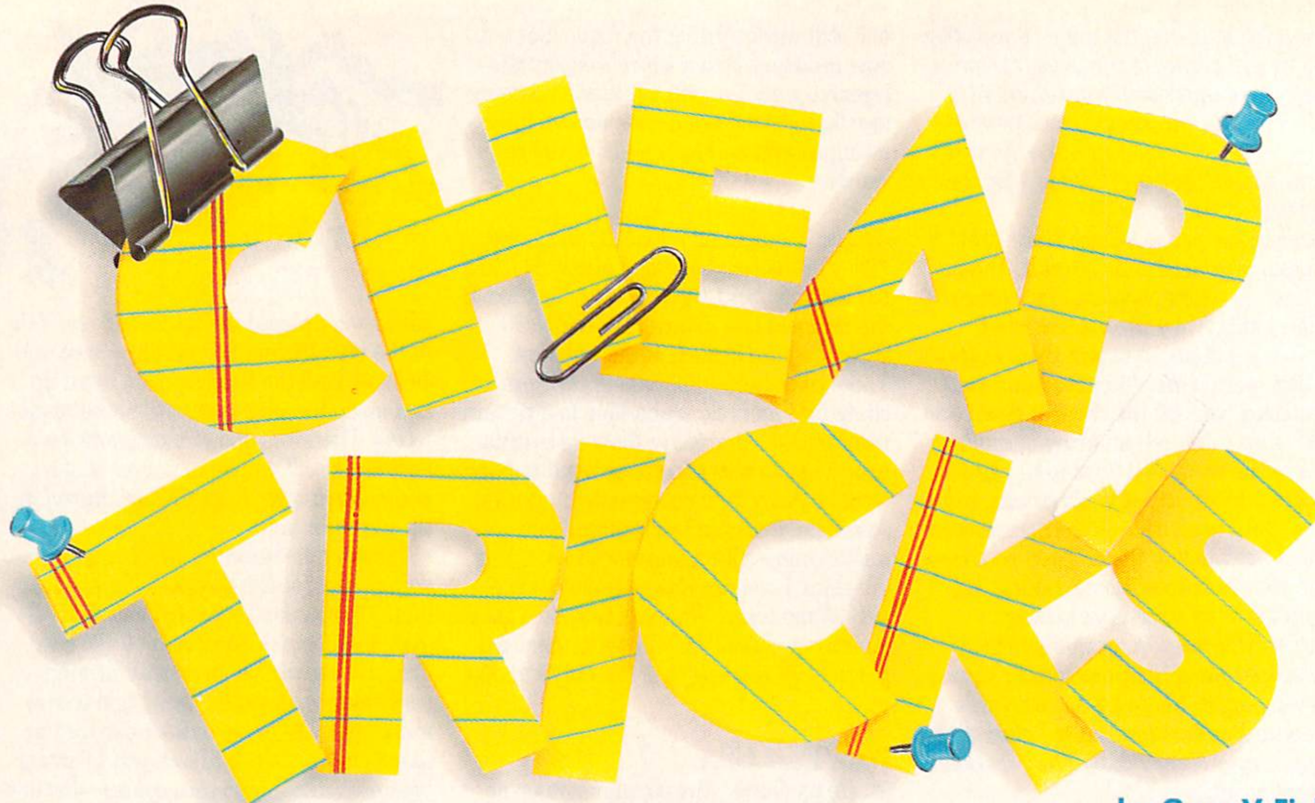
Eliminator
Netherworld



Gunship
Pirates!



Ballistix
Baal



AL COLLETT

by Gary V. Fields

Gary Fields has worked with, played with and written about just about every Commodore computer ever marketed since just about the day after each was released. Over the years he's picked up some great "Cheap Tricks" that apply to using all Commodores and Amigas for work or play.

Anyone who knows me will attest to the fact that I am cheap. I am always looking for a way to save a dollar, but I love new gadgets that let me do new things or at least let me do old things better. And above all I love being organized—a place for everything, everything in its place—and at my fingertips. Occasionally I'm able to combine all these virtues (vices)—organize and save money by making gadgets myself. And what kind of friend would I be if I didn't share the better ideas I have collected? So, what follows are some of Mr. Cheap's favorite tidbits.

Document Hanger

I'm always looking for ways to take the pain out of common chores like word processing, data entry and image duplicating. And like most computer users I spend a lot of time working on projects that require me to refer to notes or reference material—usually stored on paper. Thus, a lot of my time is wasted glancing back and forth between my notes and the display screen. This repetitive motion, looking up and down between desktop and monitor, can be a real (physical) pain in the neck unless a copy stand is used—not to mention the accompanying frustration caused by repeatedly losing my place in my notes. In an article I wrote way back in August of 1987, I told how to construct a heavy duty copy stand for under $12.

Well Mr. Cheap has a new idea which I think you will like better, works almost as well, takes up no desk space and costs next to nothing. For lack of another name, I call it the Document Hanger. It simply attaches to the side of a monitor (you can put one on both sides if you like) and lets you hang your notes, draft copies and documents right next to the display screen. This means you should never develop another neck cramp from doing the display/desktop bounce again.

All you need to construct a document hanger (See Illustration 1) is a short piece of wire, half of a small cabinet hinge, some mounting tape and a binder clip. Most hardware stores sell 1½-inch brass cabinet hinges in packages of four for around 90 cents. I use a brand of mounting tape called Magic-Mounts Wall Hangers which comes in sheets of 18 squares and sells for 43 cents. You can buy a binder clip from any office or school for about quarter, and you can get the required wire from a coat hanger. So, for less than $2 you should have enough material to make eight document hangers—give one or two to your friends.

Assembly

Construction of the hanger could not be simpler.

1. Separate the hinge by pulling the pin which holds the two halves together out of the hinge. (You only need one side of the hinge for the document hanger.)

2. Next cut a straight piece of heavy-gauge wire about 12 inches long from a coat hanger, put a 90 degree bend 1½ inches from one end, and twist a loop in the opposite end (so no sharp point is exposed).

3. Now stick a section of the mounting tape to the back of the hinge. You are ready to install the hanger. I put my first one flush with the front of my monitor about ¼″ below the top, so documents would hang at the same level as text on my monitor's display. Once the hinge is mounted, stick the bent end of the wire into the hinge's joint holes (the holes left when you pulled the pin in step one).

4. Clip the binder clip over the wire, and you are ready to work.

To use the hanger you simply open the

binder clip, slip your document in its jaws and release. When you don't need the hanger, you can swing it back and out of your way. If you wish you can hang as many Document Hangers around your monitor as you need and when they aren't in use they are almost invisible—you can store the wires and clips in a drawer if you prefer. I know the thought of having cabinet hinges attached to the side of your monitor may not sound high tech, but my motto is if it works and is cheap—do it. The Document Hanger is both.

The Line Guide

Even with the Document Hanger it is still possible to lose your space while glancing left and right between the screen and document. The next little device is even less high tech—but solves that problem. I call it a Line Guide. You can buy commercial ones made of plastic or rubber at any office supply store, but they are so easy to make it's a shame to open your wallet to buy one. The "no expense" one I use is made with a clothespin, a piece of cardboard and a small piece of mounting tape (or glue).

To make a guide, you simply tape or glue a piece of cardboard (a 1 × 8-inch size is good) to the inside of one jaw of a clothespin—real difficult, huh? To use it you just clip the clothespin below the important line in the document. I find this simple aid most useful when duplicating rows of phone numbers, lists of addresses or while typing in a program listing—especially one with lots of DATA lines. A Line Guide should take no more than five minutes to construct, and if you duplicate very many program listings from computer magazines, that five minutes could save you hours of debugging chores by helping you to avoid mistakes or accidentally skip lines.

The Foot-Operated Mouse

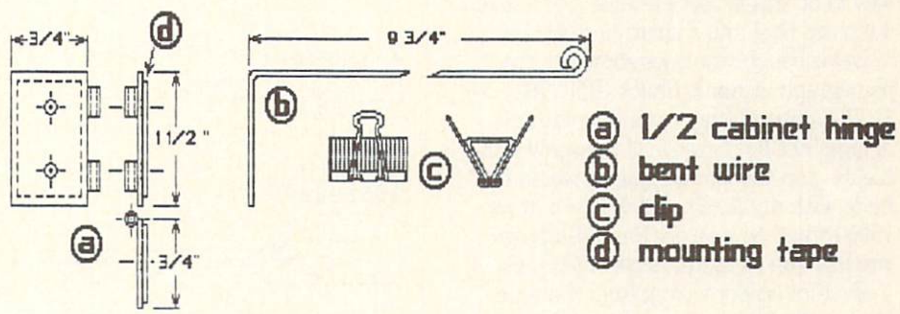
The next aide requires neither cardboard nor glue to construct and, at least at first glance, appears to be more high tech than either of the other tidbits. This device lets you operate your mouse buttons with your feet. In short, the little interface and dual switches gives you a choice—you can activate the mouse buttons with either your feet or fingers—or both.

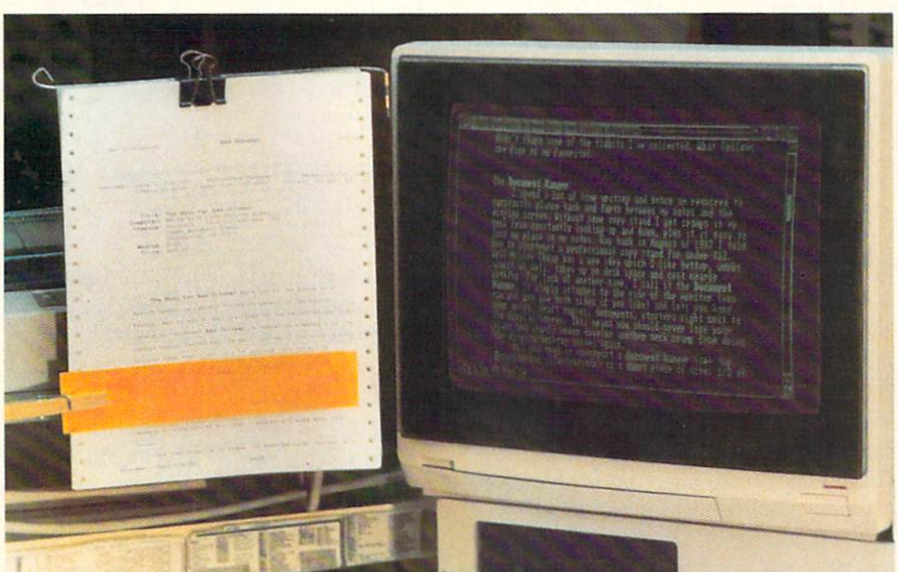
When Alan Lewis first brought this invention to the local Amiga users group meeting, he was met with skepticism. Everyone was polite and agreed the thing worked, but the real question was "Why do I *need* a foot switch for my mouse?"

Lewis explained that he had created the interface out of necessity. He is a musician and uses his Amiga and *DeluxeMusic Construction Set* to compose. But while placing notes on the screen staffs, he was frustrated at how a minor movement of the mouse (at the moment of placing a note) often resulted in misplaced and sour notes. It was his experience that the pressure necessary to press a mouse button often made the mouse move—so slightly that your hand usually could not detect it, but still enough to spoil precise placement.

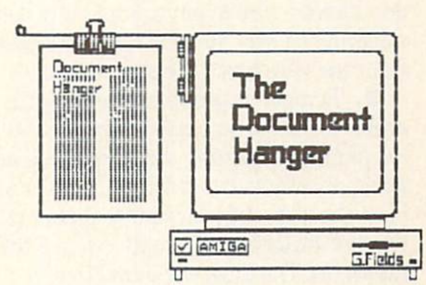
I had to agree with him—I had run into the same problem while working with both paint programs and CAD (Computer-Aided Design) programs. When trying to anchor a straight line, slight movement of the mouse at the crucial moment often caused the line to kink, and I would have to erase it and try again.

Alan's interface and two switches let the user click the mouse (place the note, anchor the line, etc.) without moving the mouse at all. The interface doesn't inter-





GARY V. FIELDS



Making a Document Hanger is simple and inexpensive. All that is required is one half of a small hinge, a short piece of wire, short piece of mounting tape and a clip.

fere with the operation of the mouse (you can still use its two buttons), but in addition to those two buttons, you have a right and left switch which can be activated by tapping with your feet.

As it turns out, the foot switches are great for games which use the mouse too. Using them, Lewis says he can literally tap dance his way through most shoot-'em-ups faster and more successfully than he could ever fire using the mouse buttons manually.

The accompanying diagram (Illustration 2) and photographs show the interface Lewis made. He constructed his so he could either connect or disconnect it using a stereo connection plug. And rather than use two separate switches, Lewis bought a used dictaphone switch at a flea market. Including the wiring, dual switch and pins, he says the project cost him under $10 and about one hour of assembly time.

Assembly

1. To construct your own dual foot switch, run parallel lines from pin 6, 8 and 9 from port one to two switches. The safest way to do this is using a male and female 9-pin din plug and a short piece of wire.

Lewis bought the ones shown in the photograph at Radio Shack (PN 276-1537/1538) and they work fine with his Amiga 500, but because of the screws and molding on the female plug, it would not mate with my Amiga 1000. If you are a 1000 owner, be sure the 9-pin din plugs you buy will fit system's port openings.

2. First solder wiring from the nine pins on the female plug to the corresponding nine pins on the male plug. Then solder another wire to pin 6, 8 and 9 (when soldering be sure you don't let the solder from one wire touch the one next to it).

3. To make it possible to unplug his switches, Lewis connected these to a stereo plug, but skipping the stereo plug and going directly to the switches is easier and even cheaper—(if you want to disconnect the foot switches you simply remove the interface). The diagram shows this simpler configuration.

4. Next you must run a wire from pin eight to one side of the gate in both foot switches (left and right).

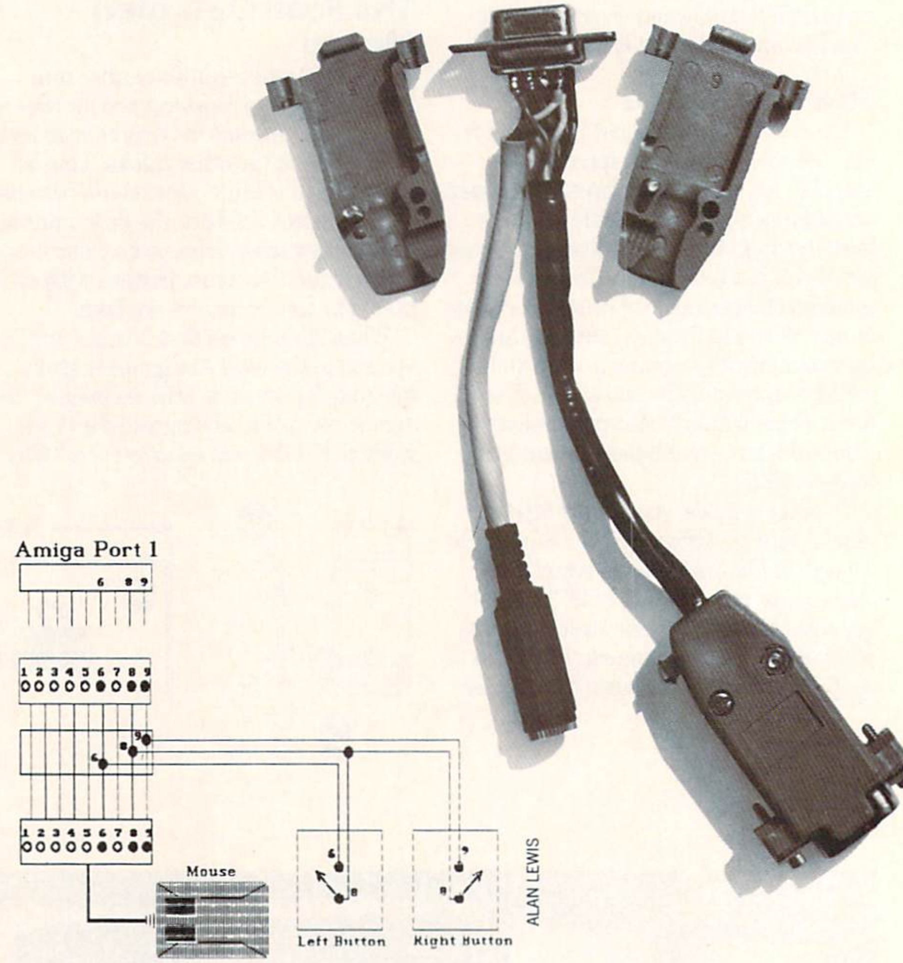
5. The last step is to take the wire from pin 6 to the switch which will be for the left button and the wire from pin 9 to the remaining gate in the switch which will be the right button.

As I said earlier, Lewis connected his interface to a used dictaphone foot switch, but any spring controlled switch will work—again check with Radio Shack or any good electronic supply house in your area. The only thing you must be sure of is that the switch is open when at rest, and closes when it is pressed.

Cheap Clean Mouse Pad

Lewis also offered a suggestion for an inexpensive, forever clean mouse pad. Rather than use a commercial mouse pad, he uses a legal size pad of paper. He chose a pad for three reasons: (1) when he first bought his Amiga, he couldn't find a mouse pad locally, (2) paper pads are ultra cheap and (3) whenever a page gets dirty, he just tears off the top sheet and presto—the pad is as clean as ever. He likes the size of a legal pad because it is almost exactly the size of a regular mouse pad.

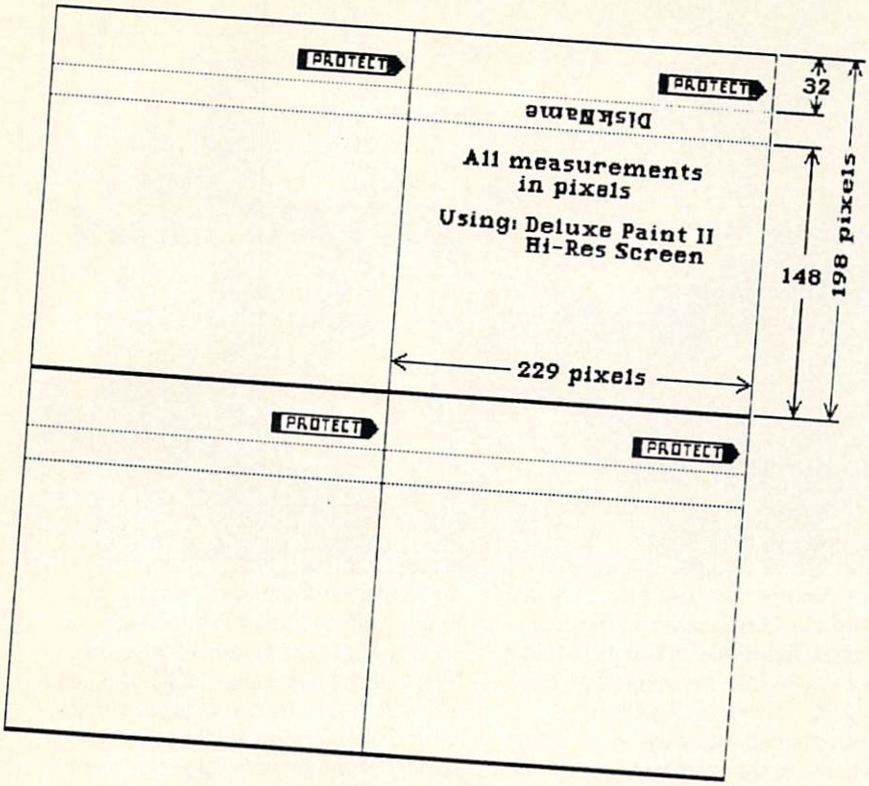
If you decide you like this idea, let me make one suggestion—resist using the top sheet of paper for jotting down notes. If you run your mouse over paper soiled with ink or graphite you will defeat the whole idea of "keeping it clean" since the residue, with time, will be transferred to your mouse's ball and rollers.



Alan Lewis' foot-operated mouse interface requires you tie into pins 6, 8 and 9 from port 1.

Personal Disk Labels

Any computer owner will agree that finding and putting your finger on a particular program disk (after your library has grown beyond a few dozen disk) can be time consuming. Unless all your programs and files are on a hard disk, you'll have to search and retrieve specific disks by hand. The first thing I relearned when I added an Amiga to my office was that my library of floppy disks (just like on the 64 and 128) have a lot in common with rabbits—they multiply and multiply and multiply. Because most of the software released for the Amiga is not copy protected, you are encouraged to make backup copies of each, and of course many programs generate the need for even more disk (databases, spreadsheet and word



This shows the .IFF template I use to create unique disk labels. The size of a label may have to be adjusted to fit your paint program and printer.



GARY V. FIELDS

Making your own disk labels is easy. I've tried other methods of binding the label to the disk (glue, sticky paper and clear tape) but nothing sticks better, with more professional results than plain old carpet tape.

processing files, graphic clip art disk, game save disks, etc.). As your collection grows, distinguishing one disk from another can be a headache, since the labels supplied with blank disks look pretty much the same.

My solution is to print special disk labels for each of my backup disks. This makes it easy to put my finger on the disk containing a file or game when I need it, since each has a unique appearance which makes it easy to spot (just like the labels on the original copies). To conserve time and material, I use *DeluxePaint II* (but any paint program will work) and print four different labels (it would be as easy to expand this to six or more) at a time. Illustration 3 shows the four-label template I use for making labels for 3.5-inch disks (64 and 128 users can use the same techniques for their 5.25-inch disks). The sizes (in pixels) I use for each label was determined by my printer (a Star NB24-10), my Preferences settings and the printer driver I use. So the results you get if your setup is different may be a little different. But with a little testing, sizing and printing you should be able to get a template which will print exactly the size you need. When you are satisfied with your template printout, be sure to save the empty version to disk so you can recall it any time you want to create a label for another disk.

The 18 pixel space below the "protect" arrow is used to show the name of the disk. If you use *DeluxePaint II,* you should type the filename using an 8 or 9 point size, then pick it up as a brush and rotate it 180 degrees (press "Z" twice) so it is upside down. Next paste the filename between the two dotted lines which define the area where the label will wrap over the top of the disk. Then when the disk is placed in a drive, the filename will read correctly, and you can easily glance at a drive and know (without removing the disk) which disk it holds. Plus, even when your disks are tightly stored in a box, you can quickly scan the different titles without having to pull each disk from the collection to read the cover. The area (229 × 148 pixels) is where you place the graphics and text which make the disk unique.

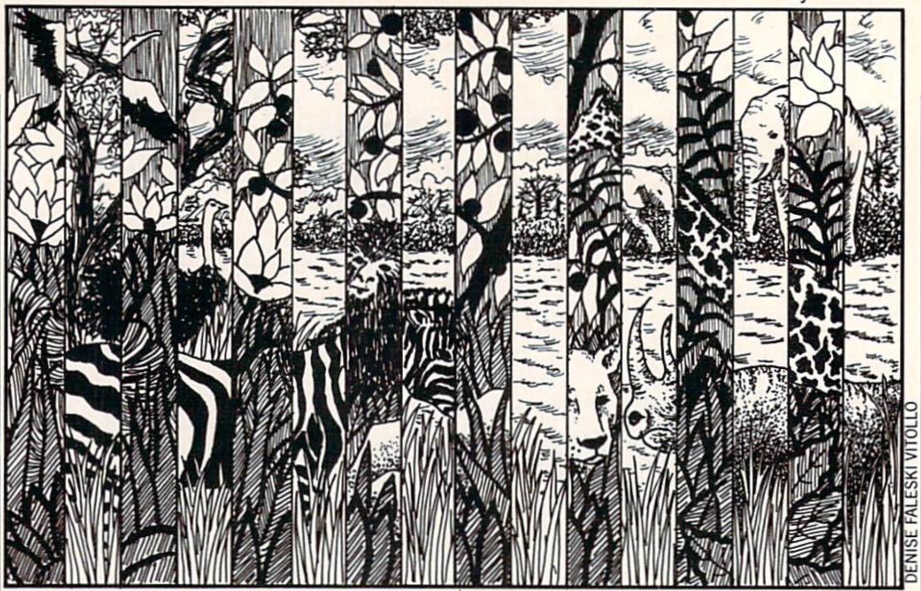
I must admit I enjoy designing and printing disk labels. I like to see how close I can come to recreating the appearance of the original, or maybe even creating a label which is better than the one which came with the original disk. If you have a color printer, the results you can achieve

Continued on page 80

by Mark Jordan

Low-Tech GEOS Games

Berkeley Softworks' series of GEOS-compatible products opens up a world of opportunity to Commodore users. Take some tips from Mark Jordan and soon you too will be Pumping GEOS.



DENISE FALESKI VITOLLO

One of the dangers of high technology is low-tech amnesia. In the headlong rush into the speed-of-light realm of electrons, it is all too easy to forget that some of the best things in life are pretty darn elemental. Take scratching, for example: is there any pill that yields a better feeling than finally getting that shoe off and getting at the itchy area?

We computer folk sometimes forget how to have fun with our computers in a "primitive" way. This article will attempt to correct that by serving up three low-tech computer hors d'oeuvres. Of course, the very fact that we are using computers may disqualify the game ideas that follow from the ranks of low-tech, but I think not. Low-tech in this case simply means "No fancy accessories needed."

And so with old-fashioned, low-tech flourish I present to you (Ta-da) low-tech GEOS Games. Appetite whetted? Read on, anyway.

Low-tech GEOS Games are nothing more than games that you design using *geoPaint*. They aren't programs. The value in using GEOS to make them is speed and accuracy. A person could create these same games by hand sans computer but, unless that person is an artist, it would take a while. And it might not be very precise when done. This month's column will present three of them.

Game 1: Animal Slide Shows

One of my strongest memories of kidhood is of me sitting in church with a pencil and paper in hand trying to entertain myself. If a friend was nearby, a game of dots was great fun. If I was by myself I might have contests to see if there were more E's or more T's on the bulletin. This one wasn't much fun and certainly lacked creativity. (The E's usually won.)

I must have been about eight or nine when someone, I can't remember who, introduced me to Animal Slide Shows. This solitaire pastime was plenty creative and intrigued me. I anticipate your question—an Animal Slide Show is two pieces of paper, one drawn into the shape of an animal cage and the other drawn as an animal. Two animals, actually. You see, the cage's bars are the exact width as the spaces between the bars so that, if the other paper is lined up underneath the cage it will show one of the two animals prowling around. The other animal is hidden by the bars. Now slide the animal picture a little this way or that and the hidden animal becomes apparent while the former one disappears.

Have you seen such a thing? If you haven't, now's the time to glance over at the "Pumping GEOS" page and check out the top half. A picture, even a mixed-up one, is worth a thousand words.

Back in those days, I would make my cage first. I made it out of paper, carefully creasing and tearing out the spaces between the bars. It was a painful and time-consuming process and not all that exact either. I made the bars thick to cut down on the number of bars and thus the number of tears.

Once the cage was done, I would place a blank sheet of paper beneath the cage and draw an animal shape in the spaces between the bars. Then I would shift the paper until the animal I had drawn was hidden by the bars and draw another. Once it was all drawn, I could entertain myself by moving the paper back and forth and watching the animals change.

I'll admit, creating the game was a lot more fun than "playing" it. Even more fun was to demonstrate it to others. Once I even showed my dad my handiwork. His only comment was, "I guess I need to gear my sermons a little more toward the youth." (My dad was the preacher.)

Okay, that's the history of the game. Now to make one using GEOS. The method I'm going to describe requires version 2.0 of GEOS. You can do the same with an earlier version (a more "low-tech" version), but it is a little less handy. The principles, however, are the same.

The simplest approach is to steal your animals from some clip art you have around. I'll be honest, I stole my lion and elephant from *Newsroom Clip Art*. If you want to create your own animal, take this tip: make your animals less than a half-window in size. You'll see why in a moment. Place just one animal in a window as far to the left as possible.

Now using the Edit Box tool (upper-right tool in toolbox) move your crosshair to the top-left corner of the drawing window and then move four pixels to the left. Click here. Now drag the rubberband down straight down to the bottom of the window and then move to just beyond the right edge of your animal and click. Go back up to the Move gadget in the upper left of your region and click it then move the whole region exactly four pixels to the right. Click again.

You have just inserted a four-pixel-wide blank vertical strip into your animal. It helps immensely if you have version 2.0 of *geoPaint* because you can use the cursor keys to make the micro-moves. By the way, do all of this with color shut off.

Now go to the top of the window again to the leftmost portion of the unsevered section of animal. Count four pixels to the right again and click. Drag down to the lower-right and click as before. Then back

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Pumping GEOS

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Great GEOS Games

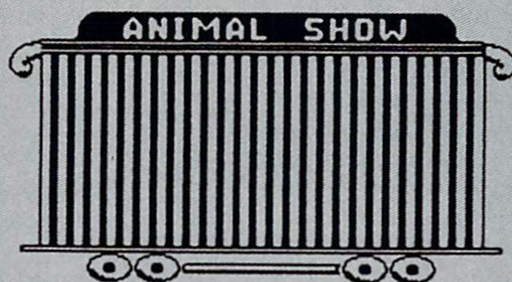


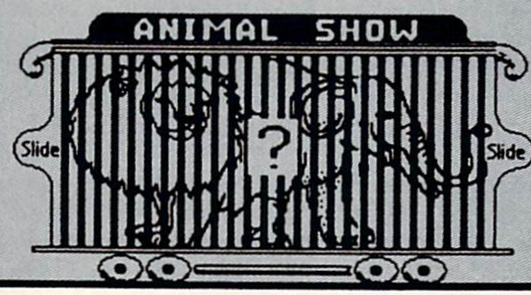
Animal Slide Show

The two components needed for an official "Animal Slide Show" are on the left: 1) the slide, and 2) the cage. If you look closely at the slide, you may be able to see Mr. Lion and Mr. Elephant.

Before you can run this slideshow, you'll need to cut out the slide and the cage. If you fold the cage in half it's easier to cut out the spaces between the bars. Or you could photocopy this page onto a transparency then just cut out the cage as is. Either way, the next step is to tape a back to the cage to create an open-ended sleeve.

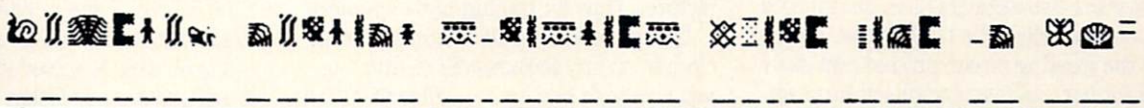
Making an animal slideshow is a lot trickier than running one. To run one you simply slip the slide into the viewer (cage) and push it left or right until one of the animals appears. Why, even your boss could do that. Granted, this isn't the type of game that is going to inspire international tournaments, but with some colored pencils and a little ingenuity, some unusual greeting cards can be produced.





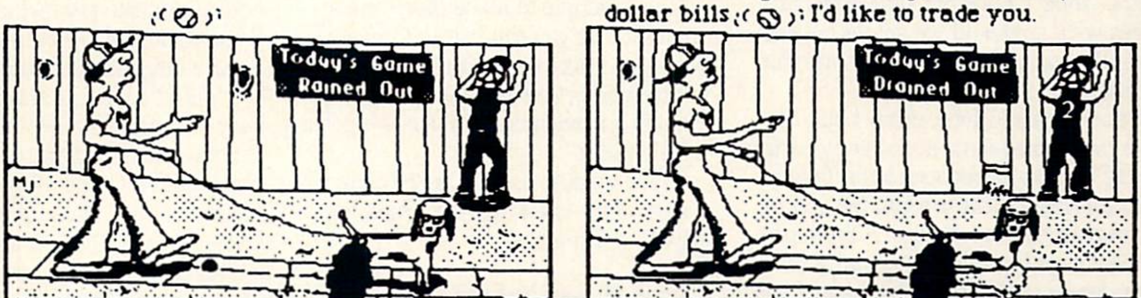
Barrington Ciphers

The following cipher is nothing more than a plain old English message typed with the Barrington font. See if you can decipher it. (Hint: lots of memory is the key.)



What's Wrong?

There are 20 differences between the two pictures below. Find them in less than 1 minute: you've got a photographic memory. One to 2 minutes: you'd make a great detective. If it takes you more than 5 minutes, I've got some crisp, new twenty-dollar bills I'd like to trade you.



Continued from page 62

up to the Move gadget, click, count four, click again. Do this until you have sliced your animal into equal strips of drawing and blank screen. That done, you must now move to the area where your other animal grazes and repeat the entire process for it.

A side note: there's nothing magical about the four-pixel widths. If you feel this results in bars too skinny to deal with (you have to cut out the spaces between them), then you can increase the width. Just be sure you keep all the intervals the same width.

You now have two sliced up animals. Use your Edit Box tool again and copy the entire window you are presently on. If you've forgotten (or never knew) how to do that, just double-click the Edit Box tool to select the whole window. Then copy it using the Copy option from the Edit menu. The disk drive will rumble (if you're not using an REU) while it creates a Photo Scrap.

Move to the area where the other animal waits. Again select the Edit Box tool and grab your animal and move it precisely over four pixels from the left of your drawing area. Now select the whole window again (double-click the Edit Box) and select Paste from the drop-down Edit menu above. When the Bitmap Scaling dialog box appears, select the transparent option then click OK. Your former animal should now appear precisely, strip by strip, between your present one.

I say "should" because that may not be exactly what happens due to who knows what all contaminating factors. At any rate, if the two animals have not merged just so, then click the UNDO box. Re-select the existing screen animal and move him (or her) up/down/over/back however many pixels you deem necessary. Repeat the process merging process.

Once that's all done, it's not tough at all to make the cage. It needs to have enough bars to make it wider than the merged animals (which we will henceforth refer to as the "slide"). Each bar should be four pixels wide as should the spaces between bars. The example should illustrate this sufficiently.

Once all this is done, print it out. The cage can be made into a viewer by cutting out all the spaces between bars. To help with this meticulous process, try folding the cage in half lengthwise. A more permanent cage (you only need make one to view dozens of slides) can be made if you rubber-cement the cage printout to a piece of poster board and use an X-acto™ knife to cut out the spaces. A simpler option than either of these is to photocopy the cage onto a transparency then use it as a window.

The finishing step is to tape a back to the cage to make an open-ended sleeve for the slide to slide into. Use paper, poster board, whatever. You're done. Fun, wasn't it? Want more fun? Try coloring the strips of animals with colored pencils. Want even more fun? Tape the whole configuration to a homemade greeting card. Make the card thematic with the animals playing an important (and possibly humorous) role.

If you're an adult you'll be surprised how much kids enjoy looking at these things. If you're a kid you'll be surprised how much you enjoy looking at these things. But I'm not surprised: low-tech GEOS Game are fun.

Game 2: "What's Wrong?" Puzzles

My childhood memories of doctors' offices are hazy. I remember one thing: the observation puzzles in the back of *Highlights* magazines. Two pictures were placed side by side, the second having a number of slight changes from the first. The reader's job was to find the differences. If ever an idea was perfect for *geoPaint,* this is it. Here's the simple process

Design a window, or if you're impatient, steal one from clip art. Now copy the entire window using the Edit Menu to create a Photo Scrap. Move your screen to another drawing area and paste the original window there. You now have two identical pictures. Now for the fun part—changes.

Using the Pixel Edit feature you can close in on any features of the drawing you choose to add details, subtract details, or alter details. It's as easy as click, click, click. Back in the Normal viewing mode, you can grab a section of the drawing with the Edit Box and then flip it horizontally or vertically for another quick change. This works great on a letter of text.

It is so simple to make these minor changes that you can use your mental powers to make very tricky changes. Don't get too tricky, however. Adding a single pixel in a random area of pixels is getting a little picky.

If you want to see a sample before you create yours, check out the "Pumping GEOS" document.

Game 3: geoCiphers

Okay, raise your hand if you can ever remember being temporarily bored in school. Wow, look at all those hands. Some legs, even. Yeah, well I remember a few fleeting moments of boredom too, but I had a great way to fill them: cryptograms. The cryptograms I loved to work were merely ciphers, messages encoded in letter-substitution codes. Having done a lot of E-counting over the years, I was quite familiar with letter frequencies in English (E leads the way, then T, then A and so on). So code-cracking was a natural.

Using GEOS provides an easy way to create ciphers to crack. If you want to get your hands dirty, you can use the geoFont editor and create your own coded font. If you don't, you can do as I did in the "Pumping GEOS" document—just use one of the picture fonts (Barrington, Hilgard, etc.) Either way, encoding a message is as easy as typing.

Just type whatever message you want to encode using any "readable" font (like BSW). Make sure you've got the message exactly right then highlight the entire message and change its font to the mystery font. The message is now encoded. One tip: the longer the message, the easier to crack. The one given as an example is a toughie because it's so short.

To help your code-cracking partner out, you might want to place some spaces beneath each letter of your message. Also, leave ample spaces between words. Then print it out. If you wish to print out the answer to the puzzle as well, simply duplicate the message with the Copy and Paste features but leave one version in English, one in code. This guarantees a mistake-free cipher.

Of course, if you're like me, you'll want to solve some as well as create them. This is a good time to introduce your husband or wife, mother or father to the computer. Show them how easy it is to make ciphers. Ask them to type out a message for you and then encode it.

By the way, this low-tech game can be played on the screen as well as on paper. If you leave the messages on the screen to solve, you can get instant hints whenever you want: just select the letter in question and change its font back to BSW.

Well, I hope this article inspires you to try out these low-tech ideas. I hope even more that you come up with some Low-tech GEOS Games of your own. If you send me your ideas (in care of this magazine), I'll pick the best for a future column. I feel good. There's nothing more stimulating than a good workout Pumping GEOS, even a low-tech one. ■

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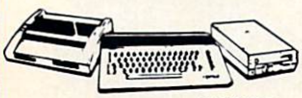
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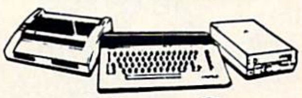
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by Shay Addams

Quest for the Orb-ison

News and opinion from a leading explorer of those fantasy realms called adventure games.



ART BAXTER

Roy Orbison, for whom the orb sought in so many adventure games was named, died in December. In honor of this rock and roll icon, whom few people realize was among the world's foremost adventure gamers, I decided to name this month's column after him. Another little-known fact I recently uncovered is that the Wright brothers, inventors of the airplane, were actually Wilbur and *Orbille* (not Orville). To bring attention to this historical update, I have changed my mind about naming the column after Roy Orbison and will instead call it "Quest for Orbille." Hold the phone—I just got another brainstorm: call it "Truth Orb Consequences" and turn it into a TV game show in which all the questions are about adventure gaming. Even better! I'll pay tribute to the peace efforts of Russian leader Gorbachev by calling it "The Orb of Gorby." OK, enough. You're probably beginning to wonder when I'm going to tell you all about the latest adventure games. Right about now . . .

On the Road with the Amiga: *AutoDuel*

The Amiga version of ORIGIN's *AutoDuel* outruns every previous edition. The story is set in a future America where outlaws roam the highways, reminiscent of the film *Road Warrior.* If you missed the original release, it's based on Steve Jackson's Car Wars, a paper and pencil role-playing game in which you design a collection of cars, trucks and vans and equip them with lasers, recoiless rifles and James Bond-style gear such as oil jets that throw pursuers off your trail (and off the road!) if things get too hot.

While completing a series of mini-missions, you'll boost your character's Driving and Marksmanship skills in an original fashion: action-oriented games that pit your car against one or more enemies on the road or in the combat arenas modeled after today's demolition derby. Interaction with shopkeepers and other non-player characters is conducted with simple menus, while keyboard, mouse or joystick controls are used in the "race car simulation" that comprises the majority of the action. With a joystick, I found the cars are far easier to control than in previous versions of the program (which—yet another little-known fact—was co-written by Chuckles of *Ultima* fame, along with Lord British).

There's but one weak point in the game design. When you complete courier missions and win important arena events, your Prestige points are increased, and qualification for being offered the final mission—the meat of the coconut, as they say down at Punchy Pete's Polynesian Lounge—is based solely on your Prestige. That means you can actually go through the entire game without solving a single one of the mini-missions. The first time I finished this game, I was disappointed to learn that the handful of missions I had yet to accomplish were insignificant, especially since I'd devoted so much time to them. But I did return to the highways and arenas of *AutoDuel*—even after completing every mission, you can still enjoy it as a shoot-'em-up, so it has much more replay value than most adventures. *AutoDuel* is also available for the Commodore 64.

Faery Tale Adventure for the 64

Yes, it is a great game, and all 40 billion screens from the Amiga version were ported over (OK, it's really just 14,400 screens—but after the first 1000, who's counting?) The story involves three brothers out to save the land of Holm from an evil Necromancer. An adventurer-friendly interface and exceptionally good graphics and animation make it fun to play.

But it's also a slow one, with frequent disk access, so only patient Paladins and Orc-slayers should venture into the land of Holm. The other drawback relates to the quest: because the various puzzles were not planned out in a linear series, you are likely to wander around for days wondering where to go next, or what to do with the golden lasso you just found. With so much territory to explore, this can be exceptionally frustrating.

Graphic Puzzlers for the Amiga and 64

Magnetic Scrolls, the British company best known for *The Pawn,* has a pair of new graphic adventures for the Amiga and 64. *Corruption* spoofs the business world and Yuppies, and *Fish* is another humor-filled outing. I'll report more details on them next month.

Rainbow Road: A Three-Player Quest

Jon Freeman, who co-designed *Temple of Apshai* (one of the original computer role-playing games), recently told me about a new Amiga game that ought to be out by now. Almost three years in production, *Rainbow Road* can be played by a single person (or even a married person, with the optional upgrade!) or as many as three. The game's most innovative aspect is that, instead of one character taking his turn while the others wait—as in other RPG's—all three can be moving, fighting, talking to non-player characters or performing other tasks—simultaneously.

It works this way: the two people who are Fighter types work with joysticks, while the Spellcaster conjures things up from the keyboard. There are 31 different characters from which to choose, and it's possible—even recommended—that you check into the Castle now and then and bring in a new character, dropping off one of the existing party for some R&R. I haven't seen *Rainbow Road* yet, but Free-fall, the design team that also created *Archon* and *Adept,* has a good track record—so you might consider buying this one without waiting for a detailed review.

The ACS Handbook

While it is easy to use, *Adventure Construction Set* remains a complex set of interacting programs whose documentation is far from adequate. To assist would-be world builders, the *ACS* Fan Club is distributing *The ACS Handbook*, a 32-page manual with chapters on each construction set and a helpful section on Game Design. For more information, write Ken St. André, 3421 E. Yale, Phoenix, AZ 85008.

Science Fiction of the Future

None of these conversions were ready at the time of this writing, but science fiction fans should keep their scanners tuned for a couple of IBM RPG's that are being moved over to the Amiga and Commodore 64. *Star Flight* is an epic space saga with a strong emphasis on character interaction with the aliens you encounter while mining for valuable ore and seeking lost artifacts on remote planets. Also an Electronic Arts title, *Future Magic* cleverly blends the old "seek and slay the Evil Wizard" theme with some unusually-illustrated space battles and exploration. It employs vector graphics as well as highly-detailed 3D illustrations.

Quest for Clues

AD&D: Pool of Radiance: If you're having trouble in combat, maybe you could use a few more magical weapons and armor. This trick, devised by QuestBuster Joseph M. Smith, enables you to duplicate these and other items, which may then be distributed to everyone in the party. First, make a back-up copy of your save game disk and use it when following these steps: (1) Give all items to be duplicated to one character. (2) Go to Training Hall and remove that character. (3) Leave the hall. (4) Encamp and save the game. (5) Turn computer off. (6) Reload game, load saved game. (7) Add the character you just removed. (8) Begin adventuring. (9) Encamp again. (10) Trade items from the character you just added to the other party members. (11) Select "Alter" and drop the character you just added. (12) Save the game. (13) Return to step 5 and repeat the process as many times as you want to duplicate the items from step 1. (14) After duplicating all the items you want, save game with all your characters.

Faery Tale Adventure: If you're running low on green keys, QuestBuster Paul Nygard suggests using the secret entrance for the fort. It's on the left side, nearly even with the door. The best place to fight when just beginning is at the graveyard: attack monsters through the fence, so they can't reach you. Save the Jade Skull from Tambry until attacked by a group containing a man with a bow. "Ask" the Sorceress in the Crystal Palace and you'll boost your luck.

The Mars Saga: Chris Logiudice, yet another rich and famous QuestBuster (on Mars, anyway), recommends Laser Slots as the fastest way to make money (after each big win, save the game outside the casino). He also advises increasing your Programming skill quickly, since it's necessary for breaking into the computer network. And there's a way to avoid combat with more powerful foes. Say no when asked "Do you attack?". If the enemy wants to fight, choose "no." When prompted for "View Combat?" jab the RETURN key quickly and repeatedly until the screen turns gray and the main menu appears.

by Jeff Spira

Core Wars

Core Wars, a hot new game for serious programmers, is sweeping the international computer programming community. Core Wars is not merely a childish computer game. It has ramifications in military software, artificial life and theoretical biology. The game works something like this: A computer arena of a specified amount of computer memory (8K for tournament play) is loaded on the computer. Two warrior programs written in the special Core Wars assembly language called Redcode are assembled in a special Redcode assembler and loaded into the Core Wars arena. The contestants are allowed a certain number of instructions to execute (50,000 each for tournament play), and the start instruction is given.

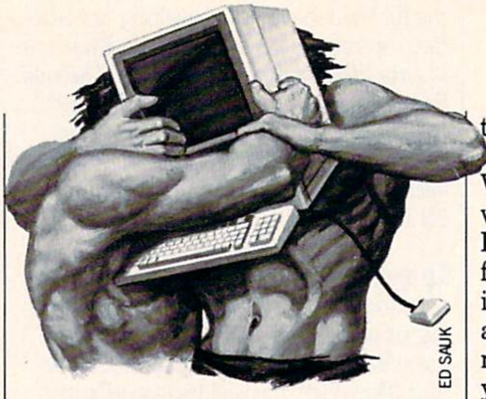
The two warriors then battle it out for control of the computer. Each opponent attempts to seek out and render the other ineffectual. If one program succeeds in stopping the other, it is declared a winner. If neither is successful in decimating the other in the 100,000 execution time frame, a tie is declared.

There are numerous strategies for defeating the opponent. One is through the use of logic bombs, guessing where an opponent might be in the arena and "bombing" the memory in that area, attempting to overwrite the opponent's operating code. Bombing is a very effective offensive strategy, but it is necessary to guess where the opponent might be to bomb effectively. Like it's real-world namesake, bombs falling in uninhabited areas are useless.

Another strategy is using "imps." Imps are the smallest possible worm programs, moving in single-instruction steps through the memory, overwriting everything they come across. Each step that the imps take can possibly catch the opponent unaware. Imps are a very important weapon of the Core Wars warrior.

Another strategy is massive replication of one program to try to overwrite it on top of the opponent's code. Massive reproduction is not a very effective strategy unless it is used with more aggressive offensive tactics.

Experienced players build defensive traps to stop these weapon strategies, while employing sophisticated routines to capture some of the opponent's code and use it against him. This is referred to as "taking slaves." If one opponent is able to take slaves, the slaves work in the opponent's time frame so as not to detract from the slave taker's offensive strategy.


ED SAUK

Much of Core Wars strategy involves program motion. This means that the code actually moves itself about in the memory of the computer. Unlike business or game software that gets loaded into a certain memory location and then remains there, the Core Wars warriors are constantly on the move to different areas of the memory to seek out the opponent and find safe havens to hide. This means that the programs have the potential to be very effective saboteurs and espionage programs in real-world computers.

Core Wars is only a simulation, though, so it is impossible for a warrior to escape the arena and wreak havoc on the computer on which it is running. Even if the warrior were loaded onto a computer without the Core Wars arena in place, it would still be completely inert because of the special Redcode language in which it is written.

The game itself provides a safe forum for the development and testing of worm, virus and logic bomb-type software. It gives serious programmers a serious game to play while pushing some of the newest concepts of computer software into ever-wider limits.

Like the age-old game of chess, Core Wars is the ultimate in strategic planning and programming skill. One obvious difference is that in chess some thought and correction can be made in reaction to the opponent's move. In Core Wars, once the game has started, the warriors operate totally autonomously. Any reactions to the opponent's moves must be previously programmed.

The International Core Wars Society (ICWS) based in Huntington Beach, California, holds an annual tournament to find out who is the best in the world. Regional tournaments are held in the U.S., Germany, the USSR, Italy and numerous other nations to find out whose warriors will compete on the International level at the annual tournament.

The Third Annual International Core Wars Society Tournament, ICWST'88, was held in Westminster, California on December 3 and 4, 1988. Warriors arrived from all over the globe to compete in the international event for cash prizes. The action was fast paced and exciting. Totally new concepts and strategies appeared this year, as they do every year. Core Wars play is becoming increasingly sophisticated and powerful as programmers perfect their techniques.

Following is a report from the tournament:

The Third International Core Wars Society Tournament

by William R. Buckley

Another battle waged, and another score recorded, the schedule of contests proceeded steadily to completion.

LOAD SLAVER.MOB , LOAD IMMOBILI.MOB , CYCLE 100000

So went the command stream from operator to keyboard to the Mapped Array Redcode Simulator (MARS). The MARS is the Core Wars coliseum where the two competing warrior programs fight it out in mortal combat. The MARS dutifully complied, giving the attending audience another battle on which to wager their opinions.

The warrior "Slaver" took the first turn, so it was loaded into the MARS first. Other warriors went first in earlier battles. They were quite different from each other and from Slaver. The warriors, "Asiwar" and "Wipe5," two strong warrior programs, showed a marked difference in their respective behaviors. Asiwar tended to win against its opponents, while Wipe5 tended to tie with its opponents. Slaver too displayed unique behavior, tending to win, lose and tie against its opponents. The techniques warriors employed varied widely, giving viewers an action-packed quest for supremacy over cyberspace.

Slaver, as its name implies, sought to entrap its opponent. Once entrapped, the opponent warrior was made to execute the same code that Slaver itself executed. This produced an effect of the two opposing warriors finding themselves working together. In this way Slaver tended to avoid a loss. The opponents of Slaver quite

often found themselves trapped, so that potential wins and losses were reduced to stalemate ties. The opponent warrior was caught with a regularly-spaced array of jump instructions, each instruction pointing to the next in line. The graphic display of a captured warrior looks a bit like a game of leap-frog, the warrior being forced to jump from one memory area to the next.

"Immobilizer" was a two-part warrior, the parts operating concurrently. Each part bombed memory with a regular pattern of 0 data memory bombs. One part bombs memory at ever-higher addresses, while the other part bombs at ever-lower addresses. Each part eventually met up with regions bombed by the other part, a sort of wrap-around attack. The bombing patterns are arranged so that they do not overlay one another. They were, in fact, evenly spaced, so that the total amount of memory checked by both patterns is actually twice that checked by only one of the bombing patterns.

The Slaver versus Immobilizer battles were very well matched, the graphic display of the tournament MARS balanced between green and red blinking pixels. The signatures of the warriors were clearly distinct. Slaver laid its trap in only one direction, to ever-higher addresses, and with a short distance between bombs. Immobilizer on the other had laid its trap in both directions at once, and with a fairly wider distance between bombs. When the two bombing patterns of Immobilizer interleaved, the separation between bombs was still a little wider than the separation of Slaver's bombs. Immobilizer proved itself the better warrior, winning two and tying two of the four battles fought with Slaver. So went but one of the more than four hundred battles fought during the Third International Core Wars Society Tournament.

Of the more than 60 entered to preliminary rounds, only 15 advanced to the finals round, among them were Slaver and Immobilizer. The others were ASI-R, Wipe5, MuleDNA, Sieve, Wally, Fydgitr, Waspnest, Death, Cowboy, Hithard2, Dude, Sud and DrDeath. Some of the entries came from Core Wars aficionados living in nations like West Germany, Italy, Canada, the United States and the Soviet Union. They proved to be the warriors to beat in Core Wars in 1988.

The battles waged provided tournament guests with a number of surprises. For instance, though most warriors scored as winner, loser and in ties, one entry scored only as a winner or as a loser. In not one single battle did the warrior Cowboy score a tie. This is a tremendous achievement, for one would naturally expect that a warrior which failed to win all battles outright would succumb to at least one opponent. Cowboy, however, would have none of that.

Fydgitr was another interesting warrior. For most of its operation, it seemed not unlike any other warrior, working its way through memory. After Fydgitr wrapped around its processing loop, the warrior began to act in a totally different manner. This is a typical plan of action for a warrior, and many players employ such techniques. What was unique about Fydgitr is the behavior displayed when wrap around was complete. Fydgitr actually gives the impression of fidgeting in memory. The graphic display is quite convincing. Exactly what Fydgitr was doing is unclear, but it would seem that the name Fydgitr was very appropriate.

By far the most intriguing warrior was MuleDNA. Not so much because it is by far the largest warrior ever entered into a contest, but because it had such a good showing. To date, Core Wars players have tended to avoid large warriors, believing that size influences efficiency, but MuleDNA's excellent showing may change that attitude for next year's tournament.

Roundrobin rules governed the contest, each warrior pairing off against all other warriors four times. In two of the battles, one of the warriors started; in the other two battles, the other warrior started. Battles between a pair of warriors were limited to 50,000 Redcode instruction executions each and was fought in an 8K instruction arena. Wins, losses and ties were recorded, assigned the respective values of 3, 1, and 0, and totalled. The final scores were so well distributed that a playoff pairing off the top-scoring warriors was not required. In fact, the top-scoring warrior was a full nine points ahead of the second-place finisher, with a total of 69 points.

The winning warrior was Cowboy, written by Eugene P. Lilitko of the Program Systems Institute of the Soviet Academy of Science. Second place was taken by the warrior Sud, written by Giovanni Ciraulo, who lives in Pistoia, Italy. The third place prize went to Douglas McDaniels of Alexandria, Virginia, for his warrior MuleDNA. These three winners will receive prizes of $250, $100 and $50, for their first-, second- and third-place showings. Congratulations to all for a well-fought battle.

by Robert W. Baker

Online Travel Information

Explore the inner workings of the Q-Link telecommunications service with network pro Bob Baker.

Back around the first of the year, the votes were finally tallied. With over 10,000 votes cast in the People's Choice Awards, the winners really were the "people's choice" on Q-Link this year. Your favorites in each category were as follows:

Adventure/Role-Playing Software
Bard's Tale III by Electronic Arts
Arcade Game
Double Dragon by Electronic Arts
Simulation Software
Red Storm Rising by MicroProse
Productivity Software
geoPublish by Berkeley Softworks
Education Software
Where in the U.S.A. is Carmen Sandiego? by Broderbund Software
Music Software
Music Studio by Activision
Graphics Software
geoPaint by Berkeley Softworks
Utility Software
GEOS 2.0 by Berkeley Softworks

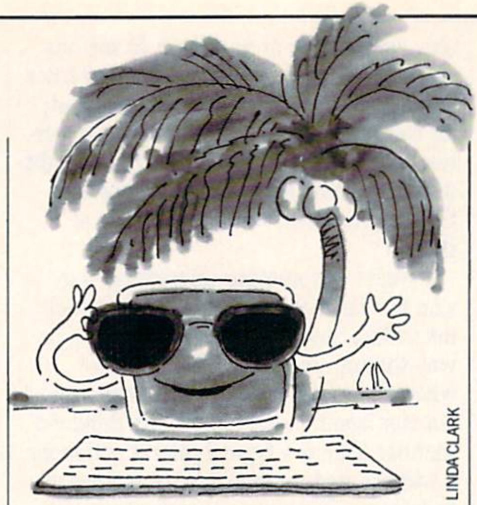
Congratulations to all the winning companies this year, and a hearty thanks to *all* the companies that continue to support the various Commodore systems.

Omega-Q

On the subject of the Omega-Q utility that I discussed in last month's column, there is now a Commodore 128 auto-boot program available. If you own a 128 or 128D, this program will automatically boot the Omega-Q utility in 128 mode from a 1571 or 1581 disk drive using all the speed advantages of the newer equipment. However, it does not run the Omega-Q utility in 128 mode; once the program is loaded, control is switched over to the 64 side to run the utility. Even so, it's a great time saver for us busy folks.

Online Games

The new online Boxes game I mentioned last month is available to download and add to your Q-Link disk, along with another new game that recently was added—QUAD 64. The Boxes game is played just like the game of dots. The game board



LINDA CLARK

consists of many rows and columns of dots that you try to connect to form boxes. The rules follow the old-time favorite we all played with pencil and paper when we were young. But on Q-Link, the system does all the work for you. Every time you add the final line to make a box, Q-Link puts your number in the box for you. When all the lines are in place, the player with the most boxes is the winner. Looks like a great online game to pass the time with friends, or to make new friends. Don't forget that you can chat with your opponents while online too.

QUAD 64 is Q-Link's newest online game at presstime. It's played similarly to Tic-Tac-Toe but with a twist. The game board has four grids of four rows by four columns. You need to place four squares in a row in the three-dimensional playing field—across, down or diagonally—to win.

You can add new games to your Q-Link disk using the Addgames utility. All of the required files can be found in the appropriate section in the Customer Service area. Just be sure to download the files to a work disk and not directly to your Q-Link disk. Complete instructions for downloading the files and updating your disk are also in the same area online. It's all pretty simple using the ADDGAMES program.

Getting Around

While in the Customer Service area you might also want to check out the new Pathnames Index found in the Newcomers section. This index shows how you can find any area you want on Q-Link, quickly and simply. Just read the pathnames index to find the feature you want from the left of the list. Then follow the "path" from there in reverse order—it's that simple. Some of the major areas of the system are listed using department abbreviations which may not be clear to newcomers, so the description of the Pathnames Index includes a list of abbreviations too.

Since the Customer Service area is a basic service and doesn't cost added plus charges, save a copy of each portion of the Pathnames Index to disk and print it out later for handy reference. It's really a great time saver, but you may want to check the date of the last update from time to time to make sure you have the most recent copy. The index is updated periodically to reflect changes on the system as they're implemented.

Several users have commented in the past on having difficulty finding information in the online encyclopedia. If you're in this category, the first suggestion is to try several related search words before giving up. Even with a very extensive data index, it's impossible to cover every permutation that might relate to a given topic. If all else fails, drop by the Online Librarian area. The QLibrarians manage the Ask the Librarian message board, with responses to your questions typically posted within 48 hours during the week. This area is staffed by the QLibrarian Dean DeBolt, who is associated university librarian and head of Special Collections at the University of West Florida. The Online Library lets you access most of the information you'll find in your local library.

TravelLink

Talk about timing! The CitiLink area saw its demise right around the time that I talked about it in this column. Well it really didn't disappear, it was reorganized or renamed or whatever else you may call it—and you'll now find the TravelLink area available with information on festivals and other events throughout the country. All events are listed by state and then by the date of the event. The information is supposed to be updated every two weeks while a HomeTown Events Board is available for anyone to post information on additional happenings. So you can check out this area for information on festivities around home or wherever you'll be traveling.

Speaking of traveling, if you're planning on taking a trip later this summer, or any time for that matter, be sure to check out the Eaasy Sabre service on Q-Link. This is the travel and reservation service managed by American Airlines and used by many travel agents across the country.

Now you can use the same system to get detailed airline flight schedule information, book flight seats, reserve hotel accommodations and rental cars, review or change your travel itinerary, check AAdvantage mileage, keep up-to-date on the Admirals Club, and much more.

The database covers over 600 airlines, 10,000 hotel properties and 20 rental companies. The system processes over 110,000 airline reservations per year, five million car bookings and 2.5 million hotel bookings. There are typically over a thousand simultaneous input messages being processed by the system every second. It takes five major IBM mainframe computers to manage the main system with over 70,000 remote terminals attached over a half million miles of communications lines. And we have direct access to the system by what's called a "gateway" connection from Q-Link.

Anyone on Q-Link can use the Eaasy Sabre system to gather information and browse around, but you need to be a registered user to actually make reservations. It's free to register, and you can sign up online at any time to get your system identification and password assigned. If you have any intention of using the Eaasy Sabre system, I strongly recommend signing up ahead of time, so it's available any time you want to use it. It can take up to three weeks for your registration to be processed.

Once registered for Eaasy Sabre, you'll automatically become a member of AAdvantage, American Airlines' frequent flyer program. This program includes flights on British Airways, KLM, Singapore Airlines, Avis car rentals, Intercontinental hotels, and Sheraton hotels, in addition to American Airlines flights. If you are already an AAdvantage member, the Eaasy Sabre system identification is your Eaasy Sabre membership number, and it should only take about three days to get approval to use Eaasy Sabre.

Before you attempt to use the Eaasy Sabre system I strongly urge you to read through the helpful informational files provided on Q-Link. You may even want to capture some of these messages onto disk and print them out for later reference. Once you enter the system, only the F7 key will be functional and is the quickest way out of the Eaasy Sabre system. All other commands and controls are entered as keyboard commands, since Eaasy Sabre was designed for access by just about any computer or computer terminal.

To move around the system, simply enter the numbers shown in the menus, and the system will guide you through the service. If you need it, help is always available by entering the word "HELP" or a slash followed by the letter H. To exit the system, enter the word "EXIT," a slash followed by the letter E, or press the F7 key. Most Eaasy Sabre commands are not case sensitive, so in general they can be entered in upper or lower case.

When searching for information and making reservations, Eaasy Sabre will prompt you for the information it needs. Much of the information you need to input or that is displayed by the system will be in the form of travel codes. You'll probably want to get a list of the available travel codes and other keywords and abbreviations used on the system for future reference, as discussed in the informational files in the Eaasy Sabre area on Q-Link. There's plenty of information in this area, so be sure to browse through all of it before wasting your time on the gateway to Eaasy Sabre.

In general, Eaasy Sabre is pretty simple to use, but until you have some practice, it may take some time to find what you're looking for. With a little patience, I've easily been able to match the super deals my local travel agent arranged. Having direct access to the information usually makes it easier to arrange your own special trip itineraries without having the intermediate travel agent. However, there are times when the travel agent's experience can be a real life saver. So you decide, the capabilities are there if you want them.

Reprints on Q-Link

Before I close things up, there's one last thing. The reprints of this column from back issues are only available online Q-Link for about the last 12 months. Several users have asked for copies of the earlier columns, since this column started in January of 1987. Well, I'm trying to get them back online and they'll probably show up in my private download library that appears in the Software Showcase. Once they're available, I'll try to put together some sort of index that you can download as well. I'm also trying to get a message board added with the current reprints, so everyone has a place to post comments and questions for this column. If all goes as planned, everything should be in place by the time you read this.

Thanks for all the previous messages and comments, as usual you can reach me via E-Mail to RBAKER, or RBAKER PC on PC-Link. ■

Continued from page 18

press slam, back breaker, gut buster, head butt, airplane spin, body slam, kick, drop kick, head throw, suplex, wrench suplex (wrench suplex?), head slap, eye rake, elbow smash, and pile driver (particularly nasty). Ninja's repertoire, for example, includes press slam, drop kick, gut buster and head throw—all executed by holding down the fire button and moving the joystick button up, down, toward the opponent and away from the opponent, respectively.

As the action inside the ring progresses, the contestants outside the ring continually spar with each other, not an uncommon practice in professional wrestling. In the event of a winner, the screen switches to a view of the animated crowd, and the victorious team struts arrogantly around the ring accompanied by irritating arcade music. Then a close-up appears of the coveted GWF (Gamestar Wrestling Federation) belt bearing the names of the victors.

Overall, the game plays well, and there is plenty of opportunity for laughs when you miss with a move; there's something inherently funny about sprites falling flat on their faces. The learning curve is short, but there is enough challenge to make this game an "old favorite" in no time. The *Take Down* computer opponent is tough, but after a few tries you can win regularly. Here, you don't get bogged down worrying about points, just keep bashing the other guy. There is a lot of room to formulate and implement strategies, plus a chance to vicariously work out your hostilities toward the technological age. If you like wholesale mayhem, you'll really go for *Take Down*.

Pinning Strategies

- Keep an eye on your strength meter. Don't forget to tag out if your strength gets low.
- If you are winning, stay between your opponent and his partner; don't let him near the front of the ring where he can tag out.
- Don't rely on throws to win, they take energy to execute. You lose almost as much energy throwing as being thrown.
- For practice and to become familiar with the custom moves, select the two-player option when playing solo. Your opponent will be utterly helpless as you pound him.
- And remember, boys and girls, don't try these moves at home—these wrestlers are professionals! ■

by Kenneth Huebner

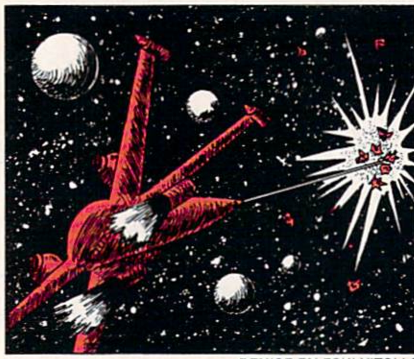
StarTrip 128

for the Commodore 128

Have you ever wished you could recreate *Star Wars* on your Commodore 128? Well, there is little chance to light-speed your way through star-filled universes using the built-in BASIC language. Here is a versatile machine-language algorithm waiting to be incorporated in any BASIC space game.

Stars in Motion

Creating the effect of motion through a particular space that is the big universe requires an understanding of perspective. Bodies that are near will move very rapidly past us, while those that are further away will move across our horizon ever so slowly. A computer algorithm must then set some stars or dots in very rapid motion and others at a snail's pace. Additionally, as a star comes closer and closer to our vantage point it will appear to accelerate in speed.



DENISE FALESKI VITOLLO

Type in Listing 1, save it to disk and then run it. The program will automatically save the machine-code algorithm in a file titled "STARTRIP.O".

The algorithm can now be included in a BASIC language game by wedging it in the system interrupt. This can be done through BASIC by SYS 4864. When the SYS command is given, my plotting routine will go to work, independent of BASIC, plotting and replotting stars in motion every system refresh or about every 1/60th of a second. To turn it off, simply SYS 4864 again. Parameters (such as speed, screen dimensions and screen center) can be set from BASIC using simple poke commands. Now just to make sure you get off to a flying start, I have included an example BASIC program to help you correctly set up the system wedge.

If you want to play my BASIC space game SpaceTrip type in Listing 2. Be sure to save it before running. SpaceTrip includes all of the elements of many classic space shoot-'em-up games: a warp drive engine to propel you through deep space, an all-purpose laser to blast deadly ships from your path and a direction indicator. At each sector level, game difficulty increases requiring you to use more warp-drive power. The game is over when the master clock goes to zero or when you have removed all deadly intruders.

I encourage you to try programming your own BASIC space game, or you could start by modifying SpaceTrip. Add some high-speed "TIE-fighter" sprites, or jazzy space music between bouts, or a few all-powerful black holes which suck you up into oblivion. Above all, in the words of one famous star hustler, "keep looking up!"

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

StarTrip (Listing 1)

```
20 REM FILE: "STARTRIP.DA"'BFGD
30 C=0:FOR X=4864 TO 5398'EMKE
40 READ A:POKE X,A:C=C+A:NEXT X'FLGF
50 IF C<>52397 THEN PRINT "ERROR IN
   DATA STATEMENTS":END'GHMM
60 PRINT "SAVING FILE:
   STARTRIP.O"'BAGJ
70 BSAVE "STARTRIP.O",B0,
   P(4864)TO P(5398)'CTIL
80 PRINT"SAVE COMPLETE-CHEK DRIVE FOR
   ERRORS"'BATO
90 DATA 76,12,19,0,160,200,80,95,7,0,
   0,0,174,10,19,172,11,19,173,9,
   19'BLUR
100 DATA 73,1,141,9,19,240,34,162,15,
    169,0,157,54,21,157,70,21,202,
    16'BKGH
110 DATA 247,172,11,19,208,12,173,20,
    3,141,10,19,173,21,3,141,11,19,
    162'BMMI
120 DATA 71,160,19,120,142,20,3,140,
    21,3,88,96,173,8,19,73,8,141,8,
    19'BKQJ
130 DATA 170,142,245,20,189,54,21,29,
    70,21,208,5,32,216,19,176,96,
    169'BKIK
140 DATA 0,32,68,20,173,3,19,240,78,
    189,86,21,24,125,54,21,157,86,
    21'BJGK
150 DATA 144,27,189,54,21,24,109,3,19,
    144,5,30,22,21,169,128,157,54,
    21'BLRM
160 DATA 189,246,20,24,125,22,21,157,
    246,20,189,102,21,24,125,70,21,
    157'BMHN
170 DATA 102,21,144,27,189,70,21,24,
    109,3,19,144,5,30,38,21,169,128,
    157'BMOO
180 DATA 70,21,189,6,21,24,125,38,21,
    157,6,21,189,118,21,32,68,20,
    144'BKPP
190 DATA 8,169,0,157,54,21,157,70,21,
    174,245,20,202,48,7,224,7,240,
    3'BJSP
200 DATA 76,80,19,108,10,19,32,210,20,
    41,252,208,95,173,244,20,41,
    15'BJLH
210 DATA 233,8,109,6,19,157,246,20,
    237,6,19,160,1,176,6,73,255,160,
    255'BLFJ
220 DATA 105,1,73,7,10,10,10,157,54,
    21,152,157,22,21,173,243,20,41,
    31'BKIJ
230 DATA 233,16,109,7,19,157,6,21,237,
    7,19,160,1,176,6,160,255,73,
    255'BKDL
240 DATA 105,1,73,15,10,10,10,157,70,
    21,29,54,21,240,18,152,157,38,
    21'BKTL
```

```
250 DATA 173,242,20,41,3,168,185,64,
     20,157,118,21,24,96,56,96,85,
     170'BJRM
260 DATA 255,255,141,236,20,174,245,
     20,189,246,20,188,6,21,32,111,
     20'BJSN
270 DATA 176,22,172,238,20,173,236,20,
     45,240,20,141,239,20,177,252,
     45'BKOP
280 DATA 241,20,13,239,20,145,252,174,
     245,20,96,205,4,19,176,89,204,
     5'BKWQ
290 DATA 19,176,84,141,233,20,140,234,
     20,152,41,7,141,238,20,169,0,
     133'BLAR
300 DATA 253,173,234,20,41,248,10,38,
     253,10,38,253,10,38,253,133,
     252'BJPI
310 DATA 173,234,20,74,74,74,24,101,
     253,105,32,170,173,233,20,41,
     252'BJJJ
320 DATA 10,144,1,232,24,101,252,133,
     252,144,1,232,134,253,173,233,
     20'BKMK
330 DATA 41,3,141,237,20,168,185,206,
     20,141,240,20,73,255,141,241,
     20'BJAL
340 DATA 24,96,192,48,12,3,56,46,242,
     20,46,243,20,46,244,20,109,242,
     20'BLJN
350 DATA 109,243,20,109,244,20,141,
     242,20,96,169,10,162,12,160,21,
     32'BJAN
360 DATA 189,255,169,0,162,8,160,0,32,
     186,255,169,0,162,19,133,252,
     134'BLEP
370 DATA 253,169,252,162,233,160,20,
     76,216,255,83,84,65,82,84,82,73,
     80'BLWQ
380 DATA 46,79,22'BIZH
```

END

SpaceTrip (Listing 2)

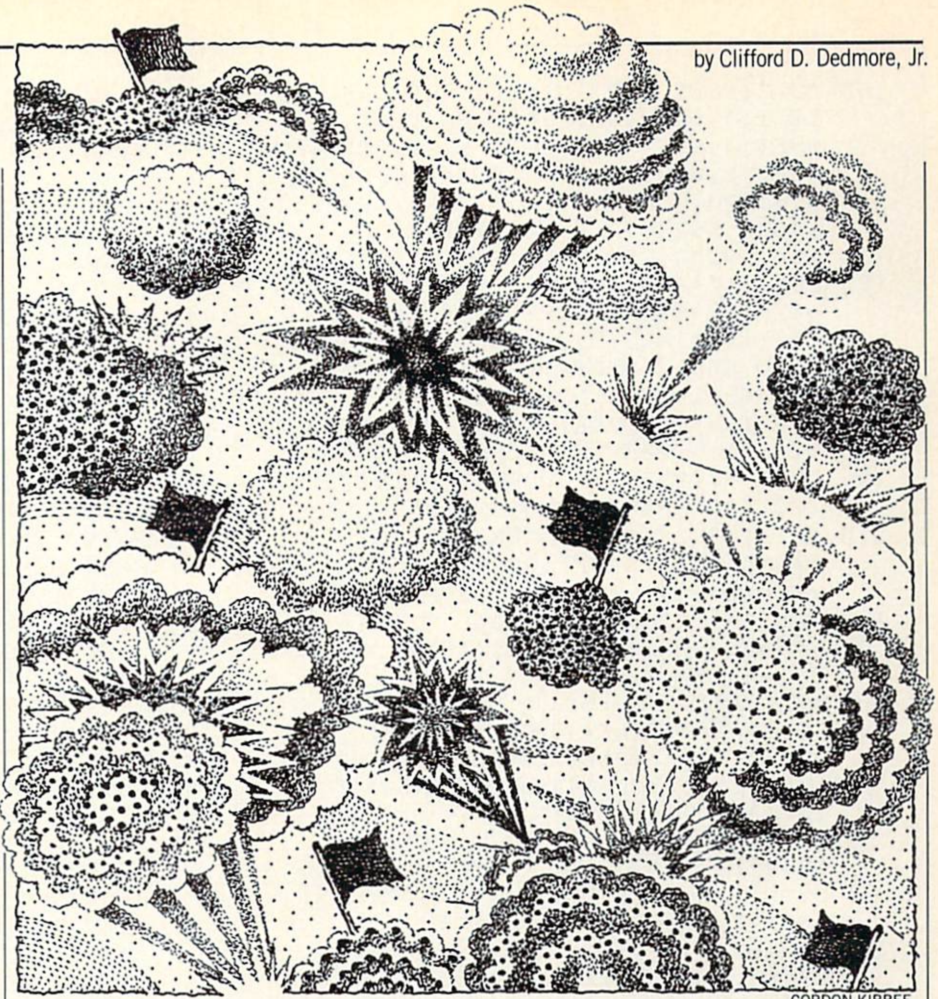
```
30 UI=4864:REM STAR INIT'CPRE
40 US=UI+3:REM STAR SPD'DNPF
50 UD=UI+4:REM XP,YP DISPLAY'DSJI
60 UC=UI+6:REM XP,YP CENTER'DRGI
70 BLOAD "STARTRIP.O",B0,P(UI)'BKYJ
90 REM INIT.GAME'BJLI
100 GP=0:GD=0:REM 0=PNTS,DIFF'DTXB
110 COLOR 0,1:COLOR 4,7:COLOR 1,7'DLYA
120 COLOR 2,2:COLOR 3,6'CHTA
130 GRAPHIC 3,1'BDJY
140 DT=152:REM DASH TOP'CNOD
150 DRAW 1,0,DT TO 159,DT'CMKE
160 CHAR 1,30,20,"N":CHAR 1,32,22,
    "E"'CRJG
170 CHAR 1,30,24,"S":CHAR 1,28,22,
    "W"'CRQH
180 CHAR 1,16,20,"WARP"'BIFG
```

```
190 CHAR 1,16,21,"TIME"'BIUH
200 CHAR 1,5,20,"SECTOR"'BHCA
210 CHAR 1,11,20,STR$(GD+1)'DNLB
220 BOX 1,24,168,24+20,168+30'DTDD
230 CIRCLE 1,122,178,13,20'BPOC
240 GT=GD*50+200:REM GAME TIME'ESEH
250 GC=0:GH=5:TS=1:TD=0
    :REM I.CLOK,HIT,SPD,DIR'FJSN
260 O1=140*GD:O2=GD*2:OD=0'FRFJ
270 OH=0:OL=GD/4+.1'ELQI
280 GOSUB 800:GOSUB 850
    :REM INIT.DASH'DRLJ
290 GOSUB 710:GOSUB 1310'CIBH
300 FOR X=1 TO 20:DRAW 1,RND(1)*160,
    RND(1)*151:NEXT'JVMH
310 POKE UD+1,DT:REM SET VPMAX'DPQE
320 CHAR 2,15,10,"STARTRIP!"'BIED
330 SYS UI:REM INIT UTL'CKUE
340 PLAY "V1O5T7QGBGO4HCO5WC"'BBVG
350 CHAR 2,15,10,"[SPACE9]"'BIYF
370 REM RUN GAME'BHHG
380 DO:J=JOY(1)'DFNI
390 IF J>127 THEN GOSUB 470'EHNJ
400 IF J=1 OR J=5 THEN GOSUB 820'GHCD
410 IF J=3 OR J=7 THEN GOSUB 760'GHJE
420 IF OD=0 AND TS>RND(0)*O1+O2 THEN
    GOSUB 890'JPKJ
430 IF OD<>0 THEN GOSUB 960'FGHF
440 GC=GC+1:IF GC=20 THEN GOSUB
    1280'GODJ
450 LOOP'BAKD
470 REM FIRE LASER'BJSI
480 SOUND 1,5000,10,2,,400,1'BSWK
490 FX=RND(0)*10+75'EJYL
500 DRAW 2,80,140 TO FX,100'COGD
510 DRAW 0,80,140 TO FX,100'COEE
520 IF OX>65 AND OX<95 AND OY>100
    THEN 540'HQHJ
530 RETURN'BAQC
540 REM EXP.OBJECT'BKVG
550 S1=INT(RND(1)*20)*1000'FNSJ
560 SOUND 1,S1+5000,140,1,,180,3'CVBK
570 SOUND 2,2000,80,1,,200,3'BSBK
580 SOUND 3,1000,40,1,,300,3'BSXL
590 OD=0:Y=2:REM OBJ.OFF'DOCN
600 L1=INT((OY-80)/2):L2=L1*2
    :L3=L1*3'IXVK
610 FOR X=0 TO 360 STEP 40'EHFF
620 DRAW Y,OX,OY TO L1;X:NEXT'DMJH
630 FOR X=10 TO 360 STEP 40'EIDH
640 DRAW Y,OX,OY TO L2;X:NEXT'DMKJ
650 FOR X=25 TO 360 STEP 40'EIJJ
660 DRAW Y,OX,OY TO L3;X:NEXT'DMLL
670 Y=Y-2:IF Y=0 THEN 610'FJBM
680 SOUND 2,S1,100,1,,3,3'BPQL
690 OX=0:GP=GD+1*100+GP'FOOP
700 GH=GH-1:IF GH=0 THEN 1420'FNEH
710 REM SET POINTS'BJMF
720 CHAR 1,7,22,STR$(GH)
    :REM NUMHIT'DSNJ
730 CHAR 1,16,24,"[SPACE7]",1'BKIH
740 CHAR 1,16,24,STR$(GP),1'COGJ
750 RETURN'BAQG
760 REM MOVE LEFT/RITE'BNIL
770 DRAW 0,122,180:DRAW 0,6;TD TO 122,
    180'DXDP
780 IF J=3 THEN TD=TD+10:OX=OX-TS-8
    :IF TD>359 THEN TD=0'MAPX
790 IF J=7 THEN TD=TD-10:OX=OX+TS+8
    :IF TD<0 THEN TD=359'MAUY
800 DRAW 1,122,180:DRAW 1,6;TD TO 122,
    180'DXFJ
810 RETURN'BAQD
820 REM NEW SPEED'BIIG
830 IF J=1 AND TS<15 THEN TS=TS+1
    :SOUND 2,5000,30,0,TS*60,70,3'JILS
840 IF J=5 AND TS>1 THEN TS=TS-1
    :SOUND 2,TS*80+2000,30,1,0,40,
    3'KIUU
850 POKE US,TS:REM SETSPD'CMXL
860 IF TS=9 THEN CHAR 1,22,20," "'ELMN
870 CHAR 1,20,20,STR$(TS)'CMVN
880 RETURN'BAQK
890 REM INIT.OBJECT'BLRO
900 OX=INT(RND(0)*100)+30:OY=80'GRYK
910 OD=1:IF OX<80 THEN OD=OD*-1'HNEM
920 OS=0:OC=0'CHYI
930 OF=INT(RND(1)*16)*3200+800'GQEN
940 OT=360/(INT(RND(1)*4+2))'GOJN
950 RETURN'BAQI
960 REM RUN OBJECT'BJIM
970 OS=INT((OY-80)/3)'ELTP
980 CIRCLE 2,OX,OY,OS,OS,,,OC,OT'BVJR
990 SOUND 1,OF,3,1,,400,0'BPHP
1000 CIRCLE 0,OX,OY,OS,OS,,,OC,OT'BVHY
1010 OX=TS*OD+OX:OY=TS+OY:OC=OC+8'HVPF
1020 IF OY>130 OR OX>150 OR OX<10
     THEN OD=0:RETURN'JSAF
1030 IF RND(1)>OL THEN RETURN'FFWA
1040 SOUND 1,9000,9,2,,800,1'BRQB
1050 DRAW 2,OX,OY TO 80,151'CNPC
1060 DRAW 0,OX,OY TO 80,151'CNND
1070 OH=OH+1'CFLC
1080 IF OH=4 THEN 1120'DHOE
1090 IF OH=8 THEN 1170'DHXF
1100 IF OH>10 THEN 1220'DIJW
1110 RETURN'BAQU
1120 REM BREAK DIAL'BJOY
1130 DRAW 2,112,190 TO 130,166'CQHB
1140 DRAW 2,124,176 TO 126,198'CQYC
1150 SOUND 3,30000,20,1,,2000,3'BUSD
1160 RETURN'BAQA
1170 REM BREAK GAUGE'BKRE
1180 DRAW 2,24,168 TO 24+20,
     168+30'ESWI
1190 DRAW 2,24,168+30 TO 24+20,
     168'ESWJ
1200 SOUND 3,10000,50,1,,6000,3'BUXY
1210 RETURN'BAQV
1220 REM BREAK SCR'BITY
1230 SOUND 2,50000,300,1,,150,3'BUYC
1240 SOUND 3,9000,150,2,,800,2'BTLD
1250 FOR X=1 TO 20'DESC
1260 DRAW 2,RND(1)*160,
     RND(1)*200 TO RND(1)*160,
     RND(1)*200'KDCN
```

Continued on page 70

by Clifford D. Dedmore, Jr.

Capture
for the Commodore 64


GORDON KIBBEE

The enemy is on the loose and it's your job to capture his flag! Beware, another enemy force is in the area and he too is trying to find the flag. It is a battle of wits and cunning to see who is the conqueror.

To play the game just type in the program, and when all of the lines entered pass the check-sum test SAVE the program to disk to ensure that you have a good copy. Then type RUN. After approximately ten seconds the play screen will appear. With a joystick plugged into port 1 select the number of players. If you select a one-player game, you will have two different modes to use: timed mode and normal mode.

The normal mode is used for practice. Once you have become accustomed to the rules of the game, you should try the timed mode. In the timed mode you have exactly 60 seconds in which to capture as many flags as you can.

If you select the two-player mode the second player must plug his joystick into port 2. (All mode selections must be made with joystick 1.) The two-player mode also has two different versions. The first is called the turns mode, in which each player takes turns looking for the flag. Once player one has made a move, he cannot move again until player two has successfully made his move. The other version is the together mode. While in this mode both players are free to move around the battle field at once.

In all of the modes (except the timed mode) the game ends when the flag has been found. A count is kept for each player to see how many moves it took to find the flag. In the timed mode the score is determined by how many flags are found in the 60-second time limit.

As far as the program is concerned, your move is not completed until you press and release the fire button. You can move around the battle field freely before you press the fire button. When you press the fire button a clue to the flag's location will be displayed; once the button is released the clue will disappear.

You can use the function keys at any time during the battle to change modes or restart the present mode. F1 will let you reselect the mode of play whereas F7 will restart the present mode.

One final note: The battle field has been booby trapped. If you uncover a grenade while looking for the flag, you will hear an explosion and immediately be sent back to your starting position. This is counted as a move.

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Capture

```
10 PRINT"[CLEAR]":GOTO 130'CEGY
20 IF L>1 THEN RETURN'ECMA
30 POKE VI,13:POKE W,32:SYS N
   :IF TI$>"000100"THEN PRINT"[WHITE]
    0":TE=1:RETURN'JVXL
40 PRINT"[WHITE]"60-VAL(TI$)-40*
   (TI$=>"000100")"[LEFT] ":TE=0
   :RETURN'JTYM
50 S=54272:POKE S+24,15:POKE S,251
   :POKE S+1,5:POKE S+5,17
   :POKE S+6,74'KLWP
60 POKE S+4,129:FOR E=1 TO 175
   :NEXT'GNLI
70 POKE S+4,128:RETURN'DHLG
80 RR=0'BDIF
90 FOR K=1 TO 30:POKE LC-120*(WI=2)
   +ASC(MID$(F$,K,1)),M
   :IF PEEK(197)=4 THEN RUN'PJWV
100 IF PEEK(197)=3 THEN RR=1'FJGA
110 NEXT:IF RR=1 THEN IF M=7 THEN RS=1
    :GOTO 310'JNME
120 M=13-M:GOTO 90'DHJA
130 DIM C(8,8):PRINT CHR$(142)CHR$(8)
    :POKE 53281,14:POKE 53280,6
    :LC=55480:M=7'ISTM
140 F$="RSTUVWXYZ[[POUND]][^,F3,
    CMDR S,CMDR Z,CMDR D,CMDR Q,
    CMDR N,SHFT POUND,CMDR POUND,
    CMDR M,CMDR +,CMDR G,CMDR @,
    CMDR T,CMDR I,CMDR K]
    "+CHR$(121)+"Q"'EHBR
```

```
150 E$="[LEFT,SHFT U,SHFT C12,SHFT I,
    LEFT14,DOWN,SHFT B,DOWN,LEFT,
    SHFT J,SHFT C12,SHFT K,UP,LEFT,
    SHFT B,HOME]":W=782:VI=781'DNOO
160 N=65520:POKE 53264,0:POKE 53287,1
    :POKE 53288,0:V=53269'FMKL
170 POKE 2040,254:POKE 2041,254'CRFG
180 F$(1)="[RED,RVS]1[RVOFF,PURPLE]
    -PLAYER-[RED]2[LEFT10]"
    :F$(2)="[RED]1[PURPLE]-PLAYER-
    [RED,RVS]2[RVOFF,LEFT10]"'CLJB
190 J8=56321:A$="[DOWN,LEFT8]"
    :C$(1)="[PURPLE] TIMED[SPACE2]"
    :C$(2)="[PURPLE] NORMAL "'EWHV
200 C$(3)="[PURPLE] TURNS[SPACE2]"
    :C$(4)="[PURPLE]TOGETHER"'CLAF
210 A$(1)="CZ":A$(2)="DMJGGPSE"
    :A$(3)="EFENPSF":A$(4)="KS"
    :FOR K=1 TO 4:H$=""'IFON
220 FOR J=1 TO LEN(A$(K))
    :H$=H$+CHR$(ASC(MID$(A$(K),J,
    1))-1)'KFGK
230 NEXT:A$(K)=H$:NEXT:J9=56320'ERGF
240 G$(1)="[PURPLE]TIMED[SPACE3]"
    :G$(2)="[PURPLE]NORMAL[SPACE2]"
    :G$(3)="[PURPLE]TURNS[SPACE3]"
    :G$(4)=C$(4)'EDSP
250 E$(1)="[RVS]":D$(1)="[RVOFF]"
    :G$="12345678":FOR K=1 TO 8'GSXK
260 B$(K)="[RED,RVOFF,SHFT O,CMDR Y,
    SHFT P,DOWN,LEFT3,CMDR H]
    "+MID$(G$,K,1)+"[CMDR N,DOWN,
    LEFT3,SHFT L,CMDR P,SHFT @]"'ENPR
270 NEXT:B$="[RED,RVS,SHFT O,CMDR Y,
    SHFT P,DOWN,LEFT3,CMDR H] [CMDR N,
    DOWN,LEFT3,SHFT L,CMDR P,SHFT @,
    UP2,RVOFF]"'CDJQ
280 C$="[YELLOW,SHFT C12]"
    :D$="[DOWN,LEFT14]"'CFPY
290 POKE V,0:IF PEEK(16370)=64 THEN
    310'FQUL
300 PRINT"[BLACK]PLEASE WAIT..."
    :FOR K=1 TO 704:READ A
    :POKE 15679+K,A:NEXT'ISTJ
310 X=INT(RND(1)*8)+1:Y=INT(RND(1)*8)
    +1:C(X,Y)=9'LAHK
320 FOR K=1 TO 8:FOR J=1 TO 8
    :IF K=X THEN IF J=Y THEN 400'MPRK
330 T=INT(RND(1)*8)+1:IF T>6 THEN C(K,
    J)=11:GOTO 400'KXKL
340 IF T>4 THEN GOTO 360'EFPE
350 O=ABS(X-K):P=ABS(Y-J)
    :C(K,J)=P*(O<=P)+O*(O>P)
    :GOTO 400'OHWT
360 IF K=X THEN C(K,J)=-5*(J<Y)-6*
    (J>Y):GOTO 400'LWXP
370 IF J=Y THEN C(K,J)=-8*(K<X)-7*
    (K>X):GOTO 400'LWCQ
380 IF K<X THEN C(K,J)=-4*(J<Y)-3*
    (J>Y):GOTO 400'LWUR
390 C(K,J)=-(J<Y)-2*(J>Y)'GPJN
400 NEXT J:NEXT K:POKE V,0
    :POKE 53248,23:POKE 53249,52
    :POKE 53250,191'GKQI
410 POKE 53251,220:IF W1 THEN W1=0
    :TI$=TY$:GOTO 730'GBSI
420 PRINT"[HOME]";:FOR K=1 TO 8
    :FOR J=1 TO 8:PRINT B$;:NEXT
    :IF RS=0 THEN 450'MVSM
430 POKE W,32:POKE VI,13:SYS N
    :PRINT"[SPACE3]";:POKE W,33
    :POKE VI,7:SYS N:PRINT"[SPACE3]
    "'ICXM
440 POKE W,33:POKE VI,10:SYS N
    :PRINT"[SPACE3]":TQ=0:S1=0:S2=0
    :RS=0:GOTO 730'JIUP
450 PRINT"[DOWN2]":NEXT
    :PRINT"[YELLOW,CMDR Y25,HOME]
    "TAB(24);'EGVA
460 FOR K=1 TO 24:PRINT"[CMDR N,DOWN,
    LEFT]";:NEXT'FHUJ
470 PRINT"[HOME]"TAB(25)"[YELLOW,
    SHFT U,SHFT C5,CMDR R,SHFT C6,
    SHFT I]"D$"[SHFT U,SHFT I,SHFT U,
    SHFT I,SHFT U,SHFT I,SHFT B,
    SHFT I2,CMDR A,SHFT I,SHFT U,
    SHFT I] "D$"[SHFT B] [CMDR Q,
    CMDR W,CMDR Q,SHFT K,SHFT B4,
    CMDR W,CMDR Q,SPACE2]";'CIHN
480 PRINT D$"[SHFT J,SHFT K4] [SHFT B,
    SHFT J,SHFT K2,SHFT J2,SHFT K]
     "D$"[SHFT U,SHFT C5,SHFT K,DOWN,
    LEFT7,CMDR Z]"C$"[SHFT C]"D$"
    [SHFT U]"C$"[SHFT I]"D$"[SHFT B,
    RED]SCOR";'BNKJ
490 PRINT"E:[SPACE6,YELLOW,SHFT B]
    "D$"[SHFT J]"C$"[SHFT K]"D$"
    [SHFT U]"C$"[SHFT I]"D$"[SHFT B,
    RED]SCORE:[SPACE6,YELLOW,SHFT B]
    "D$"[SHFT J]"C$"[SHFT K]";'BPOW
500 PRINT D$"[SHFT U]"C$"[SHFT I]"D$"
    [SHFT B,RED]TIME:[SPACE7,YELLOW,
    SHFT B]"D$"[SHFT J]"C$"[SHFT K]
    "D$"[SHFT U]"C$"[SHFT I]"D$"
    [SHFT B] [PURPLE]1-PLA";'BREP
510 PRINT"YER-2 [YELLOW,SHFT B]"D$"
    [CMDR Q]"C$"[CMDR W]"D$"[SHFT B,
    SPACE2]"G$(1)"[SPACE2,YELLOW,
    SHFT B]"D$"[SHFT B,SPACE2]"G$(2)"
    [SPACE2,YELLOW,SHFT B]"D$;'BVDO
520 PRINT"[SHFT B,SPACE2]"G$(3)"
    [SPACE2,YELLOW,SHFT B]"D$"[SHFT B,
    SPACE2]"G$(4)"[SPACE2,YELLOW,
    SHFT B]"D$"[SHFT J]"C$;'BREK
530 PRINT"[SHFT K]"D$"[SPACE14]"D$"
    [RIGHT2,UP8]";'BFYK
540 PL=1'BDBE
550 PRINT F$(PL);:JY=PEEK(J8)
    :IF(JY AND 16)=0 THEN 590'HASO
560 IF(JY AND 8)=0 THEN PL=2'FJKK
570 IF(JY AND 4)=0 THEN PL=1'FJFL
580 GOTO 550'BDJI
590 IF(PEEK(J8)AND 16)=0 THEN 590'FMXN
600 PRINT"[DOWN2,RIGHT]";
    :IF PL=1 THEN LO=1:U=2:LL=0:R=3
    :L=1'JVYL
610 IF PL=2 THEN LO=3:U=4:LL=2:R=5
    :L=3'ITIL
620 L=-LO*(L=R)-U*(L=LL)-L*(L<R AND
    L>LL)'MVWP
```

```
630 Q=0:FOR Z=1 TO 4:Q=-(Z=L)
    :PRINT E$(Q)G$(Z)D$(Q)A$;:NEXT
    :PRINT"[UP4]";'KJRT
640 IF L=0 THEN PRINT"[LEFT,UP2]";
    :GOTO 540'FHGK
650 IF PEEK(197)=4 THEN L=0
    :GOTO 630'GMKL
660 JY=PEEK(J8):IF(JY AND 16)=0 THEN
    700'GRQN
670 IF(JY AND 1)=0 THEN L=L-1'GJON
680 IF(JY AND 2)=0 THEN L=L+1'GJOO
690 GOTO 620'BDHK
700 PRINT"[LEFT3,UP3,YELLOW,SHFT U]
    "C$"[SHFT I]"D$"[SHFT B] [PURPLE]
    PLAYERS:[RED]"PL"[YELLOW,SHFT B]
    "D$"[CMDR Q]"C$"[CMDR W]"D$"
    [SHFT B,SPACE2]"C$(L)"[SPACE2]";
    'BSAT
710 PRINT"[YELLOW,SHFT B]"D$"[CMDR Q]
    "C$"[CMDR W]"D$"[SHFT B,SPACE5,
    PURPLE]"A$(1)"[SPACE5,YELLOW,
    SHFT B]"D$"[SHFT B,SPACE2,PURPLE]
    "A$(2)"[SPACE2,YELLOW,SHFT B]"D$"
    [SHFT B]";'BVOR
720 PRINT" [PURPLE]"A$(3)" "A$(4)"
    [YELLOW,SHFT B]"D$"[SHFT J]"C$"
    [SHFT K]";'BPHK
730 IF(PEEK(J8)AND 16)=0 THEN 730'FMTJ
740 J=1:K=1:K1=8:J1=8:POKE V,0
    :POKE 53248,23:POKE 53249,52'HKQR
750 POKE 53250,191:POKE 53251,220
    :POKE V,1'DXNM
760 IF L=3 THEN H=1'EEQK
770 U1=1:U2=0:IF PL=2 THEN POKE V,
    3'GORP
780 IF TQ=0 THEN TI$="000000"
    :TQ=1'FKUQ
790 IF PEEK(197)=4 THEN POKE V,0
    :RUN'GKQP
800 IF PEEK(197)=3 THEN POKE V,0:RS=1
    :GOTO 310'HRTK
810 GOSUB 20:IF TE THEN 80'DHQG
820 A=PEEK(J8):B=PEEK(J9)
    :IF L=3 AND U1=1 THEN 880'JUKO
830 IF(A AND 16)=0 THEN IF F=0 THEN
    880'HLGL
840 IF(A AND 16)=16 THEN F=0'FJBL
850 H=1'BCRI
860 POKE 2040,254:POKE V,PEEK(V)OR 1
    :POKE VI,(K-1)*3'HYER
870 POKE W,(J-1)*3:SYS N:PRINT B$;
    :IF F THEN 980'HSRR
880 IF PL=1 OR U2=1 THEN 940'FJDP
890 IF(B AND 16)=0 THEN IF G=0 THEN
    940'HLFR
900 IF(B AND 16)=16 THEN G=0'FJDI
910 I=1'BCSF
920 POKE 2041,254:POKE V,PEEK(V)OR 2
    :POKE VI,(K1-1)*3'HAFO
930 POKE W,(J1-1)*3:SYS N
    :PRINT B$;'FOIM
940 GOSUB 20:IF TE THEN 80'DHQK
950 IF(A AND 16)+(B AND 16)=0 THEN
    1100'GPIO
960 IF(A AND 16)=0 OR(U1=0 AND
    L=3)THEN 990'IQQR
970 KK=K:JJ=J'CHRN
980 K=K-((A AND 2)=0)+((A AND 1)=0)
    :J=J-((A AND 8)=0)+((A AND
    4)=0)'OIRC
990 IF(B AND 16)=0 OR PL=1 OR(U2=0
    AND L=3)THEN 1020'KUXW
1000 D=K1:K1=K1-((B AND 2)=0)+((B AND
     1)=0):C=J1:J1=J1-((B AND
     8)=0)+((B AND 4)=0)'QUVN
1010 J1=J1+8*(J1=9)-8*(J1=0)
     :K1=K1+8*(K1=9)-8*(K1=0)'OIUK
1020 K=K+8*(K=9)-8*(K=0)
     :J=J+8*(J=9)-8*(J=0)
     :IF D=K1 AND C=J1 THEN 1060'TLFP
1030 D=K1:C=J1:POKE V,PEEK(V)AND NOT
     2'GOVD
1040 POKE 53250,23+(J1-1)*24
     :POKE 53251,52+(K1-1)*24'IGII
1050 IF PL<>1 THEN POKE V,
     PEEK(V)OR 2'HJXE
1060 IF KK=K AND J=JJ THEN 1090'FKFE
1070 KK=K:JJ=J:POKE V,PEEK(V)AND NOT 1
     :POKE 53248,23+(J-1)*24'KEJN
1080 POKE 53249,52+(K-1)*24
     :POKE V,PEEK(V)OR 1'HVCK
1090 GOSUB 20:IF TE THEN 80'DHQF
1100 IF(A AND 16)+(B AND 16)=32 THEN
     790'GPCA
1110 L1=0:P1=C(K,J):IF(A AND 16)=0
     AND F=0 THEN L1=1'JYCG
1120 IF PL=1 THEN 1140'DHSY
1130 L2=0:P2=C(K1,J1):IF(B AND 16)=0
     THEN IF G=0 THEN L2=1'KBFJ
1140 IF L1 THEN 1270'CGUA
1150 IF L2=0 OR PL=1 THEN 790'FJVE
1160 IF L=3 THEN IF U2=0 THEN 790'GIHF
1170 U2=0:U1=1:IF I=0 THEN 1190'FOJH
1180 I=0:S2=S2+1:POKE VI,10:POKE W,33
     :SYS N:PRINT"[BLACK]"S2'HYSM
1190 GOSUB 20:IF TE THEN 80'DHQG
1200 IF P2>0 THEN 1230'DHPX
1210 POKE VI,(K1-1)*3:POKE W,(J1-1)*3
     :SYS N'HUJE
1220 PRINT B$(ABS(P2));
     :POKE V,PEEK(V)AND NOT 2
     :GOTO 790'HUMF
1230 POKE 2041,244+P2:IF P2<9 THEN
     790'FRBE
1240 IF P2=11 THEN 1260'DITC
1250 WI=2:GOTO 80'CGYC
1260 GOSUB 50:K1=8:J1=8:G=1
     :GOTO 920'FRRH
1270 IF L=3 THEN IF U1=0 THEN
     1150'GJUH
1280 U1=0:U2=1:IF H=0 THEN 1310'FOCJ
1290 H=0:IF L=1 THEN 1310'EJMI
1300 S1=S1+1:POKE VI,7:POKE W,33:SYS N
     :PRINT"[WHITE]"S1:IF W1 THEN
     RETURN'JXMH
1310 GOSUB 20:IF TE THEN 80'DHQA
1320 IF P1>0 THEN 1350'DHRB
1330 POKE VI,(K-1)*3:POKE W,(J-1)*3
```

Programming/Capture

```
     :SYS N:PRINT B$(ABS(P1));'JDNK
1340 POKE V,PEEK(V)AND NOT 1
     :GOTO 1150'FLWF
1350 POKE 2040,244+P1:IF P1<9 THEN
     1150'FSMH
1360 IF P1=11 THEN 1390'DIWF
1370 W1=0:IF L=1 THEN TY$=TI$:W1=1
     :GOSUB 1300:GOTO 310'IAHN
1380 GOTO 80'BCPE
1390 GOSUB 50:K=1:J=1:F=1
     :GOTO 860'FPHL
1400 DATA 0,0,0,0,0,0,0,31,252,0,7,
     252,0,1,252,0,0'BPIE
1410 DATA 252,0,1,188,0,3,28,0,6,12,0,
     12,4,0,24,0,0'BQXG
1420 DATA 48,0,0,96,0,0,192,0,1,128,0,
     3,0,0,6,0,0'BOGG
1430 DATA 12,0,0,24,0,0,0,0,0,0,0,0,
     0,0,0,0'BKTG
1440 DATA 0,0,63,248,0,63,224,0,63,
     128,0,63,0,0,61,128,0'BVHK
1450 DATA 56,192,0,48,96,0,32,48,0,0,
     24,0,0,12,0,0,6'BRQK
1460 DATA 0,0,3,0,0,1,128,0,0,192,0,0,
     96,0,0,48,0'BOAK
1470 DATA 0,24,0,0,0,0,0,0,0,0,0,0,
     0,0,0,0'BJSK
1480 DATA 24,0,0,48,0,0,96,0,0,192,0,
     1,128,0,3,0,0'BPEM
1490 DATA 6,0,0,12,0,0,24,0,32,48,0,
     48,96,0,56,192,0'BRQO
1500 DATA 61,128,0,63,0,0,63,128,0,63,
     224,0,63,248,0,0,0'BVHH
1510 DATA 0,0,0,0,0,0,0,0,0,0,24,0,
     0,12,0,0'BKTF
1520 DATA 6,0,0,3,0,0,1,128,0,0,192,0,
     0,96,0,0,48'BOGH
1530 DATA 0,0,24,0,0,12,4,0,6,12,0,3,
     28,0,1,188,0'BOYI
1540 DATA 0,252,0,1,252,0,7,252,0,31,
     252,0,0,0,0,0,0'BRHK
1550 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     1,0,0'BIPJ
1560 DATA 1,128,0,1,192,0,1,224,0,1,
     240,127,255,248,127,255,248'BDNO
1570 DATA 0,1,240,0,1,224,0,1,192,0,1,
     128,0,1,0,0,0'BQDN
1580 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0,0,0'BIOM
1590 DATA 0,0,0,0,0,0,0,0,0,128,0,1,
     128,0,3,128'BOIO
1600 DATA 0,7,128,0,15,128,0,31,255,
     254,31,255,254,15,128,0,7'BBRJ
1610 DATA 128,0,3,128,0,1,128,0,0,128,
     0,0,0,0,0,0,0'BQJI
1620 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0,0,0'BIOH
1630 DATA 24,0,0,60,0,0,126,0,0,255,0,
     1,255,128,0,24,0'BTSK
1640 DATA 0,24,0,0,24,0,0,24,0,0,24,0,
     0,24,0,0,24'BOHK
1650 DATA 0,0,24,0,0,24,0,0,24,0,0,24,
     0,0,24,0,0'BNDL
1660 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     24,0,0,24'BKWL
1670 DATA 0,0,24,0,0,24,0,0,24,0,0,24,
     0,0,24,0,0'BNDN
1680 DATA 24,0,0,24,0,0,24,0,0,24,0,0,
     24,0,1,255,128'BRNP
1690 DATA 0,255,0,0,126,0,0,60,0,0,24,
     0,0,0,0,0,0'BOEP
1700 DATA 0,0,224,0,0,224,0,30,64,31,
     224,127,240,62,87,191,192'BCFK
1710 DATA 91,112,60,92,255,192,92,240,
     60,91,127,192,87,160,124,80,
     31'BIKM
1720 DATA 128,95,224,126,80,31,128,95,
     224,124,80,31,128,95,224,0,
     96'BHPN
1730 DATA 0,0,64,0,0,64,0,0,64,0,64,
     0,0,0,0,0'BMPK
1740 DATA 0,0,60,0,0,126,0,0,126,0,
     128,60,0,96,24,0,56'BTDM
1750 DATA 126,0,14,219,0,3,153,128,0,
     248,192,0,60,96,0,31,224'BBMP
1760 DATA 0,25,224,0,60,248,0,102,60,
     0,195,28,0,195,12,0,195'BAJQ
1770 DATA 0,0,195,0,3,195,192,0,0,0,0,
     0,0,0,0,0,0'BGQO
1780 DATA 0,0,0,0,0,0,6,56,0,9,255,
     192,9,125,128,6,254'BTAQ
1790 DATA 192,1,255,96,1,255,96,1,255,
     96,1,255,96,1,255,96,1'BAJT
1800 DATA 255,96,1,255,96,0,254,96,0,
     124,64,0,0,0,0,0,0'BUVK
1810 DATA 0,0,0,0,0,0,0'BNSE
```

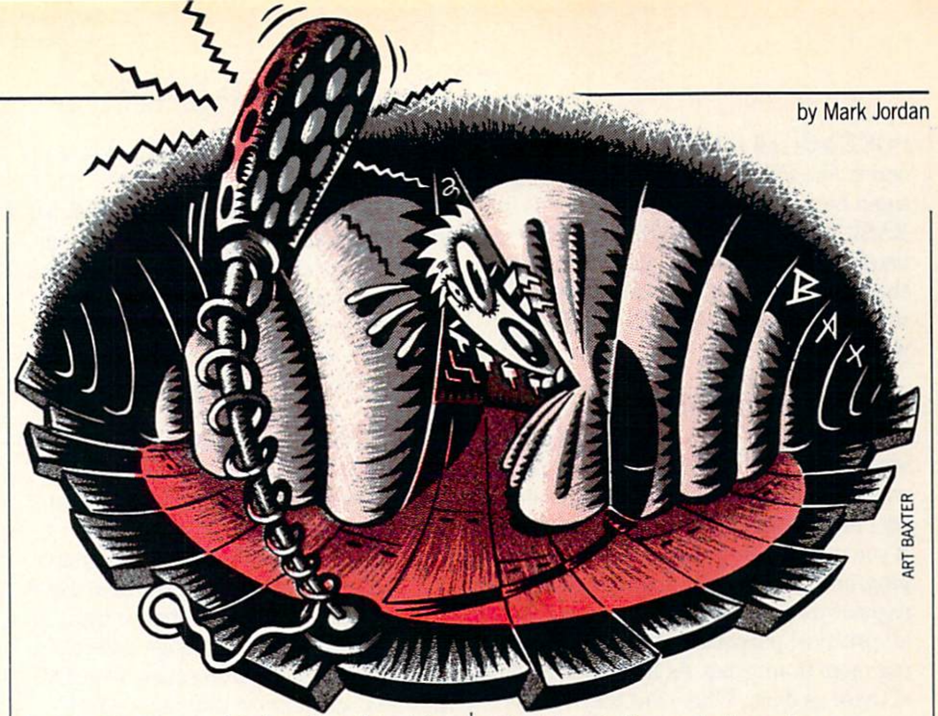
END

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Continued from page 66

```
1270 NEXT X:GOTO 1350'CGBE
1280 REM GAME CLOCK'BJVG
1290 GT=GT-10'CGSG
1300 CHAR 1,20,21,"[SPACE4]"'BIRX
1310 CHAR 1,20,21,STR$(GT)'CMKB
1320 GC=0:IF GT<90 THEN SOUND 1,1000,
     8'FQJE
1330 IF GT=0 THEN 1350'DHTC
1340 RETURN'BAQA
1350 REM GAME OVER'BIDD
1360 SYS UI:REM STAR OFF'CKAG
1370 CHAR 1,12,10,"[SPACE3]GAME OVER
     [SPACE4]"'BIHI
1380 CHAR 1,10,12,"PUSH BUTTON TO
     PLAY"'BIOL
1390 PLAY "V1O2IBAGFEDWC"'BBVJ
1400 DO:LOOP UNTIL JOY(1)>127'FHSC
1410 GOTO 100:REM RESTART GAME'CPID
1420 REM UP GAME DIFF'BKCC
1430 GOSUB 710:REM SETPNTS'CLFE
1440 CHAR 1,12,10,"SECTOR IS
     CLEAR!"'BIDH
1450 FOR X=1 TO 8'DDBE
1460 PLAY "V1O2T1IGBGC":NEXT'CCCH
1470 SYS UI:REM STAR OFF'CKAI
1480 GP=GP+GT:GOSUB 710
     :REM SETPNTS'ESAM
1490 GD=GD+1:IF GD>4 THEN 1350'FNVM
1500 GOTO 130:REM NEW DIFF'CLHB
```

END



ART BAXTER

by Mark Jordan

Exploring the VDC (and Other Things)

In the next few months we'll be exploring the technical, the whimsical and a few things in between. If there's a 128 topic you'd like to see covered, write to Mark in care of *Commodore Magazine,* 1200 Wilson Drive, West Chester, PA 19380.

Last month I promised you that we would take a vacation from type-in programs. If you glance at the end of this article, you'll think I lied—a program listing awaits you. But look at me: would this face lie? (Since you can't see my face, let me assure you that it has a very honest look to it.) I didn't lie. For one thing, that isn't really a program at the end; it's an easy-to-type-in machine-language subroutine. For another, if you'll recall, last time I said we would type in small (less than a page) things. This one is surely small. Besides, the listing at the end of this article is a bonus: it's just something you might like to have around. The article itself is about lots of things.

Okay, what are those "lots of things"? The VDC, mainly. Some news about what's happening with Commodore 128 graphics. An exciting new 128 word processor: *The Write Stuff.* And, naturally, that little subroutine at the end.

So let's get started by taking a trek over to one of the Commodore 128's twin TV towers, Station VDC (Video Display Controller—8563 on your schematic dial). The "building" may be small at Station VDC, but it's a surprisingly complex place.

Our goal this month is to see how this specialized 80-column chip works. But I assure you, this month's tour of the studio will be just that, a friendly tour. Next month we will roll up our sleeves and start to get our hands dirty by examining some of the more detailed aspects of the VDC, such as bit-mapped displays and how to use the extra RAM available in the 128D (or in machines which have been upgraded).

First a little history. When the 128 burst onto the scene, the news was that it had an 80-column chip but that this chip was hidden, obscure and incapable of graphics. For awhile, we all believed that. Then a watershed event occurred: Lou Wallace and David Darus created a high-res graphics BASIC extension. It originally appeared as a type-in magazine program; today it is incarnated as *BASIC 8.* Suddenly the news was out, and it was just a matter of time before we all began to see that the VDC was a whole lot more powerful than anyone originally knew.

Well, knowledge of the VDC grows daily, and its capabilities continue to expand. Many of you who are Q-Linkers have long since discovered 640 × 600 screens are do-able. Fred Bowen, Commodore 128 computer engineer, stated in *Twin Cities 128* that he has gotten a 752 × 600 screen. This resolution is superior to what is presently available on an Amiga (though the color capabilities fall short). This shy but mighty chip can do interlaces, bit-mapped graphics, adjustable character sizes, fast-copy routines, and more.

How far can the VDC be pushed? A long way, if the history of VIC, the VDC's 40-column brother, can be taken as a model. Just recently I saw 320 × 400 (interlaced) 64 display, an amazing and totally undocumented accomplishment.

We will use the TV analogy mentioned above to help understand how to deal with the VDC. However, it isn't just an analogy. The fact is that your computer is using television technology to create the display you see on its screen. Precisely how your computer sends its TV signal to the monitor is beyond the scope of this article; within its scope is the way you and I can control that signal. We simply go to the television station and give orders.

Inside Station VDC are a whole bunch of knobs and dials. With good old VIC you can fiddle with these dials by poking numbers into your computer. For instance, to turn on sprite 0, you need to POKE 53269 with a 1. This is no different than grabbing a dial that says "Turn sprites on" and turning it to the "1" setting. Unfortunately, the VDC's knobs and dials aren't as easily grabbed.

How to Fiddle with VDC Dials

The VDC really is a shy chip. And like shy people, shy chips must be conversed with gently—no rude poking allowed. To do so, you must understand her ways. First, this chip has 37 internal registers. As mentioned, these are different than the VIC's memory locations in that they are not directly addressable. The industrious VIC chip makes it a point to check out certain RAM bytes constantly: 53248 to 53296. Since these are memory addresses that you can alter using BASIC's POKE statement, it's easy to converse with VIC.

Not so with the VDC. This chip only looks at two bytes that you and I can communicate with: 54784 and 54785 ($D600 and $D601). So how can you turn 37 dials using only two dials? From BASIC there is only one way to do it, and that's to use the built-in system routines via the SYS command. Here's how:

To change a register:

```
SYS 52684, value,register
```

To examine a register:

```
SYS 52698,, register:RREG A
```

The first one above is analogous to a POKE and it's quite straightforward once we know what register (dial) we want and what number we want to place (instead of

POKE let's call it NUDGE) in it. The second is like PEEK. It's a tad more complicated because it takes two statements in BASIC to do it. After SYSing 52698, we need to use the RREG statement to see the results. (Be sure to include two commas after the SYS to get the register you want.)

Let's Try Something

Now that you know how to read and write to the VDC, it would be nice to know what these registers do. For now, let's just try one register to see what it's capable of. If you're a non-programmer (or even if you program), you might not know what this register business is all about. Relax: for all practical purposes registers are nothing more than bytes. As mentioned, think of them as dials. Where are they? Who cares? Where are bytes, for that matter? From a software standpoint, all you need to know is how to manipulate them.

Okay, let's recall that the VDC has 37 registers, each one of them devoted in some way to creating your 80-column screen. Register 8 is the interlace control register. In case you're wondering, interlace is a special way for your computer to "draw" your monitor screen. It is unusual because it effectively doubles your screen resolution. Unfortunately, unless you have a long-persistence monitor, you will pay a price for this double-res: a jittery display.

Let's set up an interlace mode and see how jittery. To do so, we merely need to place a 1 in register 8:

```
SYS 52684,1,8
```

Note that the value we want to NUDGE (see above) is first and the register is second. Turn on your 128 and try it. What happened? Not much. You might have noticed the screen jumped slightly when you pressed RETURN but that's about it.

Let's give it some gas. Try this:

```
WR=52684:SYS WR,3,8:SYS WR,64,4:
SYS WR,50,6:SYS WR,58,7:
SYS WR,128,0
```

Type it all as one line. Now when you press RETURN, Wow! Any typing that was on your screen suddenly is half-size. The bottom half of the display is filled with goofy characters, probably lots of them flashing. If you type you'll find yourself limited to the top half of the screen with those teeny letters.

Does your heart start to flutter? It should because you are looking at some of the magic of the VDC. The trouble is, this magic isn't doing us much good yet. But at least it shows how simple it is to deal with the VDC registers.

Some of the VDC features are already implemented through ESCape sequences or Control codes. For instance, by pressing ESCape R you can change the screen to reverse video. The VDC is responsible for this power. Let's perform the same action using our SYS method just to see how it's done.

```
WR=52684:RE=52698:SYS RE,,24:
RREG A:SYS WR, A OR 64,24
```

What we did was to first read the contents of register 24. This register has many functions, so we have to be careful about just placing a new value there. Bit 6 of this register is the only one we want to change and we want to change it from 0 to 1. We all know that bit 6 equals 64, right? And we also all know that using OR allows us to turn on an individual bit. So that's why we first read register 24, then put its contents into variable A (RREG A), then used the A OR 64 to place the bits all back in the same way except for bit 6 which is now toggled "on."

Well, even if we didn't know all that, at least we can type it in and see our screen reverse. Want to get it back? You could take the easy way by pressing ESCape N. But the point of this exercise is to get ourselves familiar with how to use the VDC. So let's do it the hard way. I'm assuming you haven't changed A since we got it.

```
WR=52684:SYS WR, A AND 192,24
```

If you'd like to experiment in that time-honored way of just grabbing dials and turning, type in this little program. Each time the prompt appears, try a different number (between 0 and 255). What you are doing is "turning" dial 0 of the VDC. You'll get some crazy displays. To restore things, whack the RUN/STOP-RESTORE keys. Then re-list the program and change the 0 at the tail-end of the SYS statement in line 20 to a 1 and run it again. You will now be turning dial 1. Try it will all 37 possible dials (registers) just to see what happens.

```
10 WR=52684
20 INPUT A$:A=VAL(A$):
   SYS WR,A,0:GOTO 20
```

Tour's over. I said it would be brief and it was. Next month, however, it's crunch time. In the meantime, you can practice conversing with Shy VDC (boy, how I wish those three letters formed a pronounceable acronym.) Once you learn her body language, look out.

The Write Stuff

I recently received a copy of the 128 version of *The Write Stuff,* a word processor from Busy Bee Software. It is a remarkable program. It has that wonderful element missing in much commercial software: "hackmanship." How does one recognize this rare trait? Easy—just look for a program that is oozing with features but not necessarily with Madison Avenue slickness. Look for one that dares to break new ground, sometimes yielding landmark discoveries, other times fizzling like soggy fireworks. Look for a program that is sporty or humorous and maybe has a few bugs lurking about. Look for one that gives the author's name and maybe address, one that has a manual with too much info on the pages which, when you read it, sounds like a real person talking to you, sometimes even expressing opinions. Most of all, look for a program that just plain works.

The thing that made me happiest about finding this quality in *The Write Stuff* is that it indicates there is still solid hacker support in the 128 trenches. I'm happy that the Commodore market has matured and that there are now some big, solid software companies supporting the 64 and 128. But a computer without good hacker support as well is BORING, maybe even communistic. And not only that, software written for such machines is inefficient and inelegant. When I first used *WordPerfect* on an MS-DOS machine, I couldn't believe how unwieldy and bureaucratic it was. I thought I had died and gone to Russia. It had about as much hacker warmth as a Siberian salt mine.

The Write Stuff is not boring. It radiates hackmanship. It isn't perfect and even lacks some features that are now considered almost mandatory such as a spell-checker (though one is likely forthcoming). But it is fast, easy to learn, and powerful. The price is incredibly cheap—under $30 and even less via a user group discount. It is a good deal both for the consumer and the Commodore 128 because it keeps 128-land a vibrant, growing, non-boring place. A future column will be dedicated to this liberty-loving program.

Two other 128-mode programs, *News Maker 128* and *Sketch Pad 128,* just arrived as I was finishing up this article, and I've had little time to check them out. Available from Free Spirit Software, they are *BASIC 8* outgrowths which will allow *BASIC 8* users more convenience. They too have a grass roots feel that bodes well for the entire 128 community. Hopefully, in an upcoming issue, I can do in-depth work with both of them, also.

128 Mode/Exploring the VDC

That Little Bitty Type-in Program

Last of all, for those who don't mind a little typing, I've included a machine-language routine which will allow you to use your mouse to move the cursor while programming in the 80-column mode. After a heavy GEOS session, I invariably find my hand reaching for the mouse when I do something else. Unfortunately, I reach and I move but nothing happens. I finally did something about it.

To use this routine, first type it and save it. Once done, RUN it. It will save a machine-language binary file called MOUSE 80.BIN. Whenever you want to use it, simply BLOAD "MOUSE80.BIN" and type SYS 6144. Thereafter, when you grab the mouse and move it, the cursor on the screen will go with you.

It isn't perfect. Sometimes the cursor will wrap around to the bottom when you move a little too fast to the top. But it is convenient. Give it a try. It's short.

Well, I'm typing this using *The Write Stuff* and my word counter feature tells me I'm over 2300 words. Time to turn on the printer and start licking stamps. And preparing for next month's excursion into the VDC's inner sanctums. I can't wait.

Continued on page 96

Software Reviews/Q*Bert and TNK III

Continued from page 23

ST76 is red, and the J122 is green. The ST76 is the toughest to defeat because it requires three direct hits and shoots ammunition in three directions at once. It also kills you the quickest. The stationary tank fires three shots at once and doesn't allow you to retreat to catch your breath. The quickest way to get rid of the green immobile tank is to storm it and fire at the same time. You generally won't lose much energy with this strategy and you can go on.

The soldiers in *TNK III* are nothing more than little annoyances. The green soldiers' fire is generally harmless. The red soldiers fire rockets that take away a quarter of your energy. Get rid of them immediately. Sometimes soldiers turn into mines when hit. Also, mines are strewn randomly throughout the game. Avoid them, for they take away a life instantly. The submarines' fire takes away one-third of your energy, so be even more careful around these enemy vehicles. They pop up in the Lake area of the game. Run by them without stopping and you'll avoid their shots.

The greatest thing about *TNK III* is the scenery. It constantly changes as you move closer to your goal and is arranged in sections that each have their own challenge and fit logically into the story. For instance, the Lake section has submarines and the Town and City sections are very tough because your turret fire blends in a little with the background of the area and tanks wait around corners. After playing the game for a few hours, you'll be able to tell where enemies will pop up in the game, and you can anticipate their movements and fire.

The key to the game, in addition to mastering your combat techniques, is learning where the letters are. They don't change from game to game and, if you know where they are, you can get to the end of the game quicker.

TNK III has addictive music and nicely-done sound effects. In addition to faithfully capturing the spirit and game play of the arcade game, the Data East version also stands alone as a very good action game for the Commodore 64. If you don't like the key definitions for the game controls, you can even redefine the keys for your convenience. In this way, if you're used to other keys for up, down, left, right, etc., *TNK III* caters to your needs. You'll enjoy *TNK III* if you're an arcade game buff, but even if you're not, it might just hook you and not let go. ■

Software Reviews/Personal Newsletter

Continued from page 19

Convert module which lets you reformat clip art files compatible with *Print Shop,* so they can be used on your pages. Another module makes it easy to import digitized images (like those Computer Eyes creates). The program comes with two disks, one of which is filled with clip art. Softsync markets two other clip art collections for those in need of lots of good graphics in a hurry.

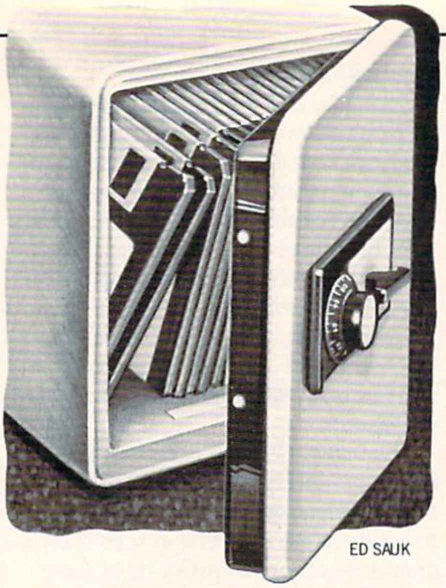
One of the nicest things about *Personal Newsletter* is that it is not copy protected, so you can make a backup copy. I appreciate this because I use a 128 in both my home and downtown office. When using software which is copy protected, I must always remember to put it in my briefcase if I will need it at work and then remember to bring it home if I want to use it later that night. But because *Personal Newsletter* can be copied, I leave a working copy in both locations. This convenience is a consideration anyone using a 64 or 128 in more than one location should consider before buying any productivity software. I give Softsync high marks for creating a useful, sensibly-designed desktop publishing program which is not copy protected.

Although this is far from the most powerful desktop publishing program available for the 64, it is the easiest to master and use. On the negative side, the program doesn't offer any simple way to create shadow boxes or screened backgrounds for text. There isn't a provision for automatic page numbering or dating, and there's no easy way to import text files created with other word processors either. But the program performs flawlessly and has enough power to satisfy most users without being too complex. This is a program you can boot and use without ever reading the manual—a statement I never make casually. Remember the old "user-friendly" label found on nearly every software box a few years ago? As we all know, that claim proved to be erroneous more often than not. Well, even though the package doesn't claim *Personal Newsletter* is user-friendly, it certainly deserves the label.

If you are looking for an easy-to-use, yet relatively powerful DTP program and you already own GEOS, this one is it. *Personal Newsletter* works equally well with either the 64 or 128 version of GEOS (from Berkeley Softworks), but without the GEOS operating system, the program disk is useless. ■

by Graham Kinsey

Amiga Public Domain



ED SAUK

This month I talk about some great animations, including the winner of the BADGE Killer Demo Contest, the finished ray-traced version of the famous Gymnast animation, plus others. Also this month there is an IMPORTANT new update to VirusX!

For each program, the author is given when known. If I obtained a PD program directly from PeopleLink's AmigaZone, the AmigaZone file number is indicated. (If no file number is given, it may still be on PeopleLink, but I obtained it somewhere else.) When a public domain program has been classified as shareware, this is also mentioned with the suggested amount.

Due to the large size of animation files being released for the Amiga, we'll assume that the normal size of an Amiga animation is one megabyte. Unless otherwise specified, *all* animations reviewed here require one megabyte to run. If you're an Amiga owner with only 512K, you should keep this in mind.

WBRexx: by Willy Langeveld
(AmigaZone file #14642)

WBRexx makes it possible for those who have the language ARexx to execute ARexx scripts from the Workbench. You have the choice to insert the name of the ARexx script inside an icon file, or for very small scripts you can even input the script itself into the icon. Although icons are used, they must not have a file with the same base name as the icon, otherwise the script will not execute. Fortunately, under Workbench 1.3 you can now use the Info option to edit an icon that does not have a file attached to it. You can use extended selection from the Workbench to execute multiple ARexx scripts in series.

Cobra: by (PLink ID: GURU)
(AmigaZone file #14683)

A puzzle game in which you move sliding tiles so that the pieces line up. Unlike most games of this genre, Cobra is not only very colorful, but also supports an intriguing wrap-around feature.

LS version 2.2: by Justin McCormick
(AmigaZone file #15133)

This is an update of Justin's Amiga port of the Unix command (and AmigaDOS DIR command replacement) LS, which was first reviewed in the May '88 installment of this column. New additions to LS include a smaller executable file size (due to compilation with Lattice C V5.0), support for residency, improved breaking (via CONTROL/C), elimination of pen color escape codes when redirecting output (which used to make LS useless if you want to print out a directory of files), alphabetical subsorting of files, support of Workbench 1.3's new file attribute bits (archive, pure and execute), and a switch to international date format.

SuperView version 2.0: by David Grothe
(AmigaZone file #14510)

Version 2.0 of the picture display program SuperView, (last reviewed in July '88) includes a bunch of new features. The mouse buttons now have functions: the left button allows you to scroll the view when displaying an overscan or super-bitmap display (or if you have used the new controls for altering the display size), and the right mouse button will load in the next picture. The spacebar is now a toggle switch for color cycling. There are command-line options to suppress the clearing of the mouse pointer or to suppress display of any author text contained in a picture (via the new ILBM author chunk AUTH which is supported in SuperView).

From CLI you can tell SuperView to fetch the list of pictures that you want displayed from a text file (which, of course, can be filled with the various command-line options that SuperView supports), or to just display any and all pictures in a given directory. While SuperView loads a new picture, it will no longer disable any color cycling displayed in the picture. A new option will give you information on a picture's size and number of bitplanes (including HAM and HalfBrite). Finally, there is a loop option which is ideal for creating a slide show that runs forever.

Coming, MarsFlight and Twilight: by Jim Robinson
(Coming: AmigaZone file #14864)

If you like large *VideoScape 3-D* animations, you've got to see these huge animations created by the author of the animation TellStar (reviewed in the September '88 installment). All these animations take up most of the space of a floppy disk.

Coming previews a much longer animation that Jim will be releasing on videotape, which is a continuation of the spaceship scenes similar to those shown in TellStar.

On the other hand, both MarsFlight and Twilight show scenes from a Martian city. MarsFlight is a four-part animation in which a spaceship flies past radar towers and zooms towards the skyscrapers in the heart of the Martian city. Twilight shows a Martian hovercraft flying along an illuminated highway (complete with poles radiating beams of light!) at night towards the martian city.

These animations are huge indeed. Coming takes up 720K of disk space, MarsFlight takes up 800K, and Twilight takes up 840K (when you de-warp the Twilight animation, there will be only seven disk blocks free on the disk out of over 1700). However, the large file size yields amazingly long animations. While most *VideoScape* animations last only a second or two before they loop, Coming lasts five seconds, Twilight runs for 13 seconds, and MarsFlight will play for 15 seconds. (These times were taken on an Amiga 2000HD running the animation with Hash Enterprises' PD ANIM-format animation-viewer Display (reviewed in the December '88 installment of "Amiga Public Domain") running at maximum speed. Although these animations are great on a normal Amiga, they really scream on a souped-up Amiga like the Amiga 2500.

Movie version 1.3-fix: by Byte-by-Byte, Inc. (AmigaZone file #14364)

This fixed version of the Movie program no longer leaves the drive light on while a *Sculpt* animation is playing. It's nice to forget about the drive light when playing *Sculpt* animations. However, the major problems with Movie—concerning the

stack and playing non-overscan animations in an overscan environment—still infuriate me.

Reset: by Justin McCormick
(AmigaZone file #14083)

A small program that when executed will instantly trigger a re-boot of the Amiga. Obviously this program should never be executed while any program is accessing a floppy/hard/RAM drive. While normal users might wonder what good such a program can do, I'm sure many developers and other people will be delighted to obtain this program for use in tasks to be carried out via batch files.

Ruler: by Thad Floryan and Chad Netzer
(AmigaZone file #14640)

This program is an ASCII ruler that makes measuring columns of ASCII text very easy. You can specify how many columns wide the ruler is when you load the program, you can also instantly resize the ruler at any time from 12 characters to as large as your screen is wide. (I was able to stretch it up to 85 columns in my overscan environment.) Be warned that this program is totally useless if you use a font that isn't eight pixels wide. (I tried different fonts using SetFont, and Ruler never adjusted to different size fonts.)

SetFont version 2.5: by Dave Haynie
(AmigaZone file #10685)

Version 2.5 of the font changer SetFont, (first reviewed back in the November '87 installment of this column) gives you complete control over what displays will be affected by a change in font. There are four places to pick from. As in SetFont version 2.0, you can choose to change the font in just the current window, or the font used in all the title bars. With SetFont version 2.5, you can also affect the font used for Workbench "BarLayer" areas, and you can change the default Workbench font (which would be used when opening new windows and menus). SetFont allows you to mix and match these four options to you heart's content, and the default is for SetFont to affect all four areas.

ShowFont version 3.1: by Arthur Johnson, Jr. (AmigaZone file #15119)

Version 3.1 of the font-viewing program ShowFont, (last talked about in the February '89 installment). ShowFont version 3.1 allows you to change the display resolution when viewing fonts, and also lets you select a font in the file requester display via a double-click of the mouse. Two bugs that I have noticed in ShowFont are the lack of overscan support, and when you use the scroll bar when viewing a large font, the font display window is continuously refreshed (which ends up looking almost as bad as interlace flicker) until you click on one of the arrow gadgets.

Stud: by Griff Jackson
(AmigaZone file #14501)

A no-frills five-card stud game written in compiled AmigaBASIC. Since you have the option to fold before the second card is drawn with no penalty, you can use this to your advantage over the dealer and create a mathematical edge over him by only playing when your first card is higher than his.

Gymnast: by Marvin Landis
(AmigaZone file #14388, 14389)

This is a sequel to the amazing animation BoingThrows (reviewed in the August '88 "Amiga Public Domain"). This is *not* the wireframe version that many people have already seen (and drooled over); this is the fully ray-traced version! Unfortunately, Gymnast had to be scaled down from 500 frames to 230 frames before the ray-traced version was created, since the original version would have taken a full *six months* to render on a stock Amiga 2000. The scaled-down version took *only* 12 days to render using the new faster *Sculpt 4-D*.

Even though this animation was scaled down, it is still quite amazing. All those who saw BoingThrows will just love the fact that a basketball backboard stands silent in the background while AmiGuy (the name given to the computer athlete) performs giant swings and other moves, including a very nice release move on the high bar.

Marvin states in the documentation that he also scaled down the dismount, since people kept telling him that the move was "not humanly possible" (that is, they could not believe that AmiGuy was a computer image!).

NetHack: by Olaf Siebert
(AmigaZone file #14890)

NetHack is an expanded version of the fantasy role-playing game Hack (reviewed in the January '88 column). If you liked Hack, you'll love NetHack.

A major addition to NetHack are the new character classes. Besides the old classes of Caveman, Wizard, Tourist, Archaeologist and Knight (the Fighter class no longer exists in this version), there are seven new classes. Elves are quick fighters with tremendous awareness of their surroundings. Valkyries are tough female warriors that can withstand severe punishment from monsters. Healers not only come into the game with many healing potions, but can also detect the medical state of any creature at any time. Barbarians possess great strength and a two-handed sword. Samurai are quick and possess very sharp swords. Ninjas are even quicker than Samurai and come into the game with plenty of throwing stars. Finally Priests bring a holy mace as their weapon, and also have some magical abilities.

Speaking of magic, the other main addition to NetHack is the spell system. Characters can now find a spell book, which they can attempt to read in order to learn and later cast a spell. Now all characters also have energy points, which are needed to be able to cast any spell. Only Wizards and Priests start the game with some spell books, but any character class can pick up a spell book and have the potential to cast spells. As you might expect, however, nothing is easy in NetHack. The spell books are only useful for a limited time, as the magical runes fade with each reading.

The only other noticeable addition in NetHack are the fountains. When your character drinks from these, he or she will find out if the fountain contains magical waters, poison or something else. One problem with NetHack right now is that almost all characters are just the standard ASCII symbols. The author did create a few monochrome graphics symbols, but compared to the later version of Hack this game isn't graphically stimulating. Even if you like Hack, you'll still probably want to switch to NetHack.

Zippy: by Mike Weiblen
(AmigaZone file #14402)

Unlike most Directory-Utilities that use primarily text gadgets, Zippy's user interface consists mainly of graphical gadgets and pull-down menus. Although Zippy's list of standard features isn't exactly impressive, the program does allow you to add your own menus with your own functions via a simple script language. This is the one feature that makes Zippy different from other Dir-Utils. You can even specify a menu shortcut for each menu option. You have the ability to create multiple menu headings (as long as you don't go beyond the right edge of the title bar) or use just one.

Charon: by Bradly Schenck

Here is the GRAND PRIZE winner of

the 1988 BADGE Killer Demo Contest! This *Director* animation is in essence an animated, musical short story based on a story written in 1915. The animation starts with the opening of a book to show the title page (a segment which embarrasses MicroIllusions' *Faery Tale Adventure* attempt at this effect). After the remarkable music starts to play, the story is gradually told between various graphic and animation scenes, including an excellent fade-in of a colorful flying bird.

The remarkable thing about Charon is that none of the graphics were digitized—they were all hand drawn. Although this demo certainly isn't tops in the "eye candy" department, I can still easily understand why it was awarded the grand prize.

Ooooh!! and Waveform Designer: by James Ianni

Two AmigaBASIC programs of different types. Ooooh!! is a simple AmigaBASIC graphics demo, with many menu options to choose from. Although at first it looks like just another lines demo with cycling colors, the variety of options add some spice to the program. You can vary the length of the trail from none to infinite. You can switch between monochrome and color display. If you get bored of the lines, you can choose from Frames, Boxes, Circles and Arcs (each with user-definable radii) and stars (with user-definable number of points). Also you can add sound effects, and you have ten different waveforms to choose from. X and/or Y-axis mirroring can be turned off or on at any time. The line drawing speed can be varied, although the computer will draw fewer lines in order to make the demo run faster.

Waveform Designer is intended for those who don't want to bother with graph paper when creating AmigaBASIC waveforms. In addition to drawing the waveform, you can perform flips and inverts on it. Harmonics can be generated at any time, and you can even combine harmonics from totally different waveforms. Frequency can be doubled or halved, and the amplitude can be modified as well. There are many basic waveforms available in the menus to select and then modify if you wish. An oscilloscope option is available, but it is terribly slow (more on this later). Scrolling can be performed on the waveform in any direction. There is an option to smooth out a waveform for those who can't draw very well.

When you are ready to test the waveform, you can either play a C note just once or every second, or have the program play a diatonic scale or a C major chord scale.

Although these programs look very interesting, the results are less than ideal, to say the least. As you might have guessed, I'm criticizing the pathetically slow speed that these programs run at due to the snail-like nature of AmigaBASIC. Even with Absoft's *AmigaBASIC Compiler*, these programs might be quite useful (compared to the program written in C or Modula-2, that is), but many options are just too slow to even bother with. It's sad to see another case of good programming trashed by a ridiculously slow language.

VirusX version 3.1: by Steve Tibbet (AmigaZone file #15414)

Viruses on the Amiga just became potentially *much more destructive*. I say this with good reason! Recently Steve Tibbet came across a new virus that breaks the mold for Amiga viruses. This new virus, called the IRQ virus, has one huge distinction from previously-known Amiga viruses. the IRQ virus *is not a boot-block virus!* That is, unlike every other Amiga virus to date, the IRQ virus does not reside on the floppy disk boot blocks and load in when the Amiga boots. Instead, this virus attaches itself to executable files.

What does this mean? well, first of all, the IRQ virus can potentially affect even non-bootable devices (more on how later). For example, it can affect files in your RAM: (or VD0: or VDK: or RAD:) disk. It can even affect files *on your hard drive,* even if it's not an auto-booting hard drive. Those who have experienced viruses on MS-DOS machines and high-end computers will recognize the potential for this virus to spread as rapidly as viruses on those machines (compared to the relatively slow growth rate of the Amiga boot-block viruses).

Okay, so what does this virus actually do? Well, once you have executed an infected program, the virus writes itself to memory. Then it immediately looks at the first program called in the startup-sequence and tries to infect it. If that doesn't work (for example, if the first entry doesn't contain an executable program), then the IRQ virus tries to infect the AmigaDOS DIR command inside your C directory. Fortunately, the IRQ virus is non-malevolent in intent. The only thing it appears to do is to alter the title bar of the CLI with some text (that, of course, lets you know that you are infected).

Of course we all know how "innocent" the SCA virus turned out to be, so don't let this keep you from protecting yourself. The reason I'm shouting about this virus is to warn you that *all* other virus checkers *are totally useless* against this virus! No Amiga PD virus program (including VirusX versions 2.1 and earlier) or commercial virus program (like Discovery's *V.I.P.*) will protect you from this virus.

Until you get version 3.1 of VirusX, there are two things you should know. First of all, if you insert a TAB before the first entry in your startup-sequence, the IRQ virus will not be able to read the entry, therefore it can't infect that program. Second, this virus *crashes* under Kickstart 1.3 (this does *not* apply to Workbench 1.3, only Kickstart). That means that if you have the Kickstart 1.3 ROMs installed in your machine, you cannot be infected with this virus. (When it tries to install itself your Amiga will Guru.) You thought that the Kickstart ROMs were only needed for hard drive owners, didn't you?

One last note: VirusX version 3.0 will protect against the IRQ virus, however, it will not protect against two new boot-block viruses: the Pentagon Circle and SystemZ viruses (which Steve doesn't explain in the documentation). Needless to say, to be safe you should get a copy of VirusX V3.1 as soon as possible.

If you like animations, you'll definitely want to check out next month's column. I will have not one, but two TWO MEGABYTE animations to talk about! Of course there will be many other good programs reviewed, including a much-needed update to the superb fantasy role-playing game Moria.

As always, I can be reached on the AmigaZone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617) 769-3172 (300/1200/2400 baud, running 24 hours a day), addressed to SYSOP.

Thanks to James Ianni for sending me his AmigaBASIC programs for review. If you have written a public domain/shareware/freely-distributable program, or have obtained one that you think is worth mentioning to all Amiga owners, then please attempt to contact me via the above contacts, or through *Commodore Magazine*. See you next month!

To sign up to PeopleLink and their AmigaZone, call them at: (800) 524-0100 (voice) or (800) 826-8855 (via modem).

For information on obtaining programs mentioned in this column, write to: SMAUG, c/o 1015 S. Quincy, Apt. 112, Quincy, MA 02169.

by Matthew Leeds

Color Hardcopy Options

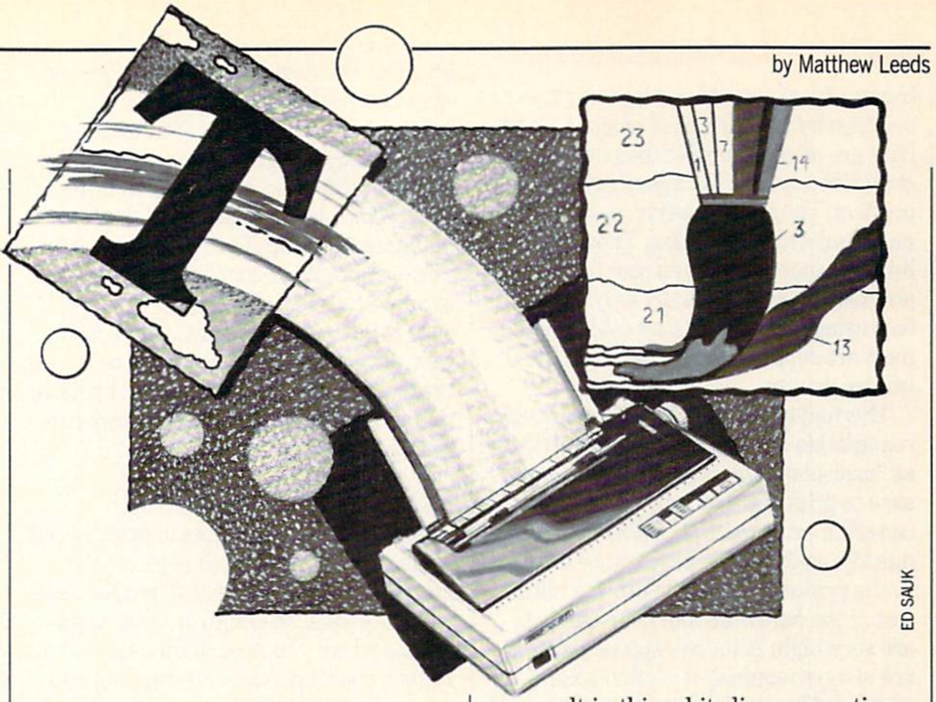
The Amiga is an extraordinary color graphics computer. No other computer offers so many options for the creation of dazzling color displays—paint programs, video digitizing, ray tracing, scanning—the list seems endless. But sharing these graphics with those who do not own an Amiga can be difficult. That's where color hardcopy comes in handy.

A hardcopy of Amiga graphics is much easier to carry around than a color monitor and computer. It can be mailed, carried in a briefcase or pinned up on a wall. Color hardcopy options include a variety of printers, film recorders, video printers and photography. Each process has its advantages and disadvantages, and each is rapidly changing as technology advances.

In evaluating each option you should consider the initial cost of the hardware, cost per copy, time to produce each copy, accuracy of color, range of color, ease of interfacing, availability of supplies and service, ease of maintenance, noise during operation and ease of use. You should also consider all of these elements within the context of your needs. If you are planning to produce only a few color printouts, the speed per copy or cost per copy may not be critical, but the accuracy might be. If you live away from a major metropolitan center, the availability of supplies might be a critical factor.

Dot Matrix Printers

Most end users own a dot matrix printer. They offer a good price/performance ratio, can be used for both graphics and text, have low costs for both hardware and supplies, and are available just about everywhere. Dot matrix printers use a printhead that contains a series of tiny wires or pins. These pins strike against an inked ribbon and press it against the paper, leaving a series of dots behind. As the printhead moves across the paper, the pins continuously fire to form a strip of information: text or graphics. To print color a three- or four-color ribbon is used, and multiple passes of the printhead print each color in turn. Additional colors are created by overprinting colors and/or using dither patterns.



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Dot matrix printers offer a low-cost entry into color printing, in terms of both the initial hardware costs and the per-page costs.

Basic dot matrix color printers like the Star Rainbow have a nine-pin printhead. More advanced (and more expensive) printers such as the NEC CP6 use 24 pins. More pins allow for a greater density of dots per inch and better-looking graphics. Dot matrix printers offer a low-cost entry into color printing, in terms of both the initial hardware costs and the per-page costs. They generally require no special paper, and the ribbons are not expensive. Most, if not all, can be connected using a standard printer cable, and printer drivers are available for all but the most exotic. Ribbons are generally available at most computer retailers as is service for simple problems.

Inexpensive dot matrix printers do not offer accurate color rendition or a great range of color. Even the most expensive dot matrix printers have a limited range of colors, and cloth ribbons quickly lose their edge resulting in washed-out colors. Since dot matrix printers are impact printers, the printhead makes quite a racket while in use. Waiting for the printhead to make four passes or more for each strip of image can add up to quite a wait as well. Paper positioning is not exceedingly accurate in many dot matrix printers, and tiny shifts in paper feeding can result in thin white lines separating strips of image.

Thermal Transfer Printers

Thermal transfer printers offer another approach. There is a great variety available in both price and function. On the low end is the well known Okimate 20, a cousin of impact dot matrix printers. All thermal transfer printers use a wax-like ink on a carrier, and thermal transfer printheads that heat the ink then contact the carrier to the paper to transfer the ink. The Okimate 20 uses a dot matrix printhead and a three-color ribbon. The ribbon carries the three colors in sequence: a strip of yellow, a strip of magenta and a strip of cyan. A short marker band separates each set of three strips between the cyan and yellow.

On the high end are several $5000+ thermal transfer page printers. These printers image a full page at a time and use a ribbon carrier that is just larger than the page to be printed; for a standard page the ribbon is just over 8.5 inches wide, and each band of color is just over 11 inches long. The paper is generally mounted on a rotating drum. The printer contains sufficient RAM to store the entire page in memory. Each color is printed to the entire page in one pass as the drum rotates. Four rotations complete the printing cycle (yellow, magenta, cyan, black).

As you can imagine, there is a considerable difference in just about every consideration between these two types of printers. The low-end thermal transfer printers generally require a special smooth-surfaced paper for best results. They are very slow to print a page, and often have paper

transport problems that result in gaps or overlaps between strips of image. The ribbons are often expensive compared to the cloth ribbons used by impact dot matrix printers. They are, however, generally much quieter in operation. They offer a limited range of color and poor to fair color accuracy. They are usually easy to interface using standard printer cables, and most are supported by current Amiga printer drivers.

Thermal transfer page printers provide remarkable quality, sometimes described as "near-photo" quality. They are often slow to print the first copy of a page, but can often print multiple copies of a page quickly, as the entire page can be retained in the printer's memory. Both the initial cost of the hardware and per-page costs are very high. Although special paper is not always required, it is often recommended. The availability of supplies and service may not be good, as these are specialty items used mostly by medium and large businesses. They are usually very quiet in operation—no louder than a photocopier.

Ink jet printers are easy to interface, have a moderate per-page speed and generally provide good range and accuracy of color.

Ink Jet Printers

Ink jet printers are non-impact printers. They literally spray ink onto the page. The ink may be stored in refillable tanks or in disposable cartridges. The printhead is generally composed of a series of nozzles, with one or more dedicated to each of the four colors. Several different strategies are used to propel the ink: from thermally-induced expansion to pizeo-electric pumps to electrostatic dispersion.

The remarkable thing about ink jet printers is that they are extremely quiet in operation. It is possible to carry on a telephone conversation while one is printing on your desk. While the first models were difficult to maintain and offered a limited color range, the latest generation of printers has overcome these early limitations. The HP Paintjet can be found for just over $1000 and generates excellent results. While the per-page costs are higher than that of impact dot matrix printers, they are lower than thermal transfer page printers. The best results require the use of special coated paper.

Ink jet printers are easy to interface, have a moderate per-page speed and generally provide good range and accuracy of color. Some older models are difficult to maintain, clogging if not used every day. The availability of supplies may vary but is generally good. Given the higher per-page costs compared to dot matrix they may not be the best choice if you print color graphics only occasionally, but I believe that they offer the best current price/performance ratio.

Other Options

Each of these three types of printers can be used to print out a full page of color graphics. If you are involved in color desktop publishing, ad design or other applications where you need to fill a full 8.5 × 11-inch page you need this capability. In cases where this is not a requirement, other types of color hardcopy devices may be used. These include video printers, film recorders and direct photography of the screen.

Video Printers

Video printers use the same video signal as your monitor to produce a printout of the image on the monitor. The technology has evolved from simple 16 shades of gray to the current 16,000,000 colors supported by the Sony Mavigraph Color Video Printer. The actual print process is similar to thermal transfer page printers, and the per-page costs are just as high. Many video printers contain a frame store that can grab an image from moving video. This is useful in creating a printout of an animation or game that cannot be paused, or of a video effect occurring in real time.

The hardware cost of a video printer is currently high, and their availability is poor. This will change as the major video hardware manufacturers introduce still video cameras to the consumer market. Although not currently affordable or available to most of us, video printers may show up shortly in quick print service bureaus or one-hour photo labs.

Film Recorders

A close cousin of the video printer is the film recorder. There are two basic types: digital and analog. Digital film recorders are not currently supported on the Amiga, as this requires applications that send information on structured graphics. This may change shortly, since several structured drawing programs are scheduled to be released this year, and some may support digital film recorders.

Analog film recorders use the same video signal as your monitor. Instead of printing an image on paper as video printers do, they record the image on film—usually as a slide or instant print. Their advantages lie in their ability to produce high-resolution results free of distortion, blur or color bias.

Some film recorders offer settings (hardware or software controlled) for various types of film, and most have some kind of raster fill capability.

A film recorder is basically a monochrome CRT in a box with a camera mounted at one end and a color wheel in the middle. This is a gross oversimplification but does allow you to picture the primary components. The monitor is extremely high resolution with a perfectly flat face mounted exactly parallel to the film plane of the camera. The color wheel is either a solid-color red, green and blue optical glass filter set, or dichroic filter set mounted exactly parallel to the film plane and CRT.

The camera and lens are also special. The lens is a flat field designed to match the flat CRT. The camera's film advance can be controlled via software. Some film recorders offer settings (either hardware or software controlled) for various types of film, and most have some kind of raster fill capability. This is generally a multi-exposure process during which the raster scan line on the CRT is shifted a fraction of a scan line up or down to eliminate the recording of a raster line on the film. Some systems can shift one-half a scan line (two exposures per color) and others can shift a quarter scan line (four exposures per color).

The Imprint system from American Liquid Light uses a Polaroid Palette Film Recorder and Amiga-specific software. This is the only film recorder with software that directly supports the Amiga, although other film recorders can be used with an Amiga. The Imprint software controls the exposure and film advance, and it can grab any IFF screen image and send it to the film recorder. It uses raster fill to double the vertical resolution of the final image.

Photographing a Monitor

If you cannot afford a film recorder but need to produce slides or prints of Amiga screen graphics, I can offer you some tips on photographing directly from your monitor. First, use a tripod or other stabilizing device. You cannot handhold a camera and get good results when photographing a monitor. Second, for slides use an ASA 100 film like Ektachrome or Fujichrome; avoid Kodachrome, as it has too much contrast. For prints stick to an ASA 100 film as well. Third, do your work at night or in a room that you can completely darken. The only source of light should be the monitor itself. Fourth, use a cable release or self-timer to release the shutter. You will be using a moderately long exposure time, and you might induce some camera movement when you press on the release.

Fifth, use a long lens. The absolute minimum is the standard 50mm lens. If you can, use an 85mm or 105mm lens in its place. A zoom lens with some telephoto capability is still preferable to a 50mm lens. The longer lens will help eliminate the distortion caused by the rounded surface of your monitor. Sixth, get your camera perfectly parallel to the face of your monitor and the lens exactly centered on the middle of the face of your monitor. This will help eliminate the distortion caused by the curved edges of your monitor.

Start with a shutter speed of $\frac{1}{4}$ second and a lens setting of F5.6 or F8. You must use a shutter speed of less than $\frac{1}{15}$ of a second to avoid imaging the raster scan itself. Bracket your exposures by changing the f-stop setting in one-half-stop increments a full stop above and below your starting point. If you are shooting slides, tell your lab to use care in mounting your slides. Since they will have black edges, some automatic slide-mounting equipment gets confused, and your film may suffer as a result.

One final note, if you are using a color printer—dot matrix, thermal transfer or ink jet—remember that the paper you use with your printer can make a tremendous difference in the quality of the final result. The weight, brightness, gloss, grade, grain, opacity, smoothness and smudge resistance of the paper should all be considered. Your local print shop, stationery or art supply store can advise you and possibly provide you with samples for testing. A little time invested in exploring the possibilities can make a substantial difference. ■

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tect commercial software. To do this the program can read and save an image of the boot block of any disk the user wants to safeguard. Once cloned, the image of that block is numbered and stored safely away to a special database. If a virus slips into the user's library in the future, the information to restore the infected disk to its original glory is as simple as reversing the process.

Reconstruction

If a disk becomes infected and the user has saved a copy of the boot block to a *V.I.P.* database, the program can reconstruct the block. Many times the infected block may have originally been empty, in which case *V.I.P.* will simply install the DOS default boot. The importance of this step is not to restore the disk's health, but to purge the virus, so no other disks will be infected. But if the destroyed boot block belonged to a non-standard commercial disk, reconstruction (providing the healthy block image had been saved to a *V.I.P.* database earlier) will not only purge the virus, but will also bring the disk back to life.

I view *Virus Infection Protection* as just another insurance policy. I don't like paying money for insurance; I hope I'll never need the protection, but if some day a despicable virus invades my software library I'm sure I'll view the cost of this policy as one of my wisest investments.

V.I.P. is painless to use, although I found all its options a little confusing at first, primarily because of its brief 18-page manual. But after familiarizing myself with the program by testing each feature to see what happened (and then rereading the manual), I found *V.I.P.* easy to use and far less time consuming than I expected. All the utility's features are menu driven and on-screen help is available for each.

The only complaint I have is that the program ignores the Amiga's multitasking capabilities. I would like to be able to toggle between this utility and other programs, but that option was left out. I tried the old standby of pressing the AMIGA key and "N" and "M" to toggle between screens, but that doesn't work here either.

Except for that single complaint, I found that *V.I.P.* delivered the protection it promised without problems or hesitations. For those interested, the program will report information in five different languages (English, French, German, Italian, Spanish and Danish) and the master disk is not copy protected. ■

Continued from page 4

setting. Now, let's see if any of you will accept my dare! I'll be looking out for you. (By the way, I won't accept a redone shoot-'em-up arcade game to fulfill this dare. Come out with something innovative!)

Sincerely,
Peter C. Frank
President Commodore Club
Port Chester High School
Port Chester, NY

Big Blue Review

To the Editor:

In the February 1989 issue of *Commodore Magazine,* Michael Miller (president, SOGWAP) wrote to you asking why *Big Blue Reader* was not mentioned in the November 1988 issue in the feature on Commodore 128 software.

My father told me about this program. He is a pastor and many programs for church use come only in IBM format, and we have a Commodore 64. He would very much like to use those church programs, and I would like to use some of the IBM games. When he read about *Big Blue Reader,* he and I both wanted to learn more. Can you provide some information about the program?

Sincerely,
Greg Bohlken
Chattanooga, TN

Editor's Response:

Due to popular demand, look for a review of SOGWAP's Big Blue Reader *(Commodore 128 version) next month in* Commodore Magazine. *Keep in mind, however, that* Big Blue Reader's *function is to copy files. It will not make MS-DOS software run on a 64.*

Animal Modification

```
8990 REM INITIAL KNOWLEDGE
9000 Q$(1)="IS IT A
     VERTEBRATE":TR(1,1)=2
9010 TR(1,2)=3:Q$(3)="DOES
     IT HAVE 6 LEGS?"
9050 TR(3,1)=4:TR(3,2)=5
     :Q$(5)="DOES IT SPIN
     WEBS"
9055 TR(5,1)=6:TR(5,2)=7
9105 Q$(2)="DUCK":TR(2,1)=-1
9110 Q$(4)="ANT":TR(4,1)=-1
9115 Q$(6)="SPIDER"
     :TR(6,1)=-1
9120 Q$(7)="SNAIL"
     :TR(7,1)=-1
```

Address letters for publication to: Letters Editor, *Commodore Magazine,* 1200 Wilson Drive, West Chester, PA 19380

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may match or surpass the quality of commercial labels. But even with a conventional printer you can add plenty of color to your labels—just print on colored paper.

One of the advantages of colored labels is that you can reserve a particular shade for each category of software. For instance, I use a pale green paper to print labels for my word processing backup files, disks containing clip art have orange labels, and my Kickstart disk has a bright yellow label so I can put my hands on it in a hurry. You can find colored paper at any school supply dealer, but I found some nice paper at a reasonable price at K-mart. And, of course, don't forget to check with your software dealer—most of the ones where I shop carry packages of computer paper in assorted colors, complete with track guides. I've used plain old construction paper but was disappointed with the results. My printer just can't produce a good, hard image on the soft, rough surface of construction paper.

Sticking the final label on your disk is simple and clean. I've tried different mediums but far and away, the best is double-faced carpet tape. I buy my tape from a local carpet store and a two-inch by 25-yard roll costs $4. I don't know how many labels you can stick with a single roll, but I have done a couple hundred labels and am still using my third roll of tape. To use the tape, simply print your labels and apply strips of tape to the back (don't cut the labels apart just yet). Be sure to overlap the outline of each label. With the tape in place, use scissors to separate the labels. When you are ready to put the label on a disk just peel off the backing and press it in place being sure the upside-down filename between the parallel lines shows on the top edge of the disk. I've never had a label that's affixed this way come loose. Yet because the tape material sticks together you can remove labels, if you wish, by simply loosening an edge and peeling it off.

I've tried other material for sticking disk labels: glue, contact paper, regular double-sided tape, paper with glue you moisten, etc. But for flexibility, durability and professional appearance, the combination of carpet tape and regular paper is best. I had high hopes for the glue-backed paper, but after a short while the label always came loose—apparently because the glue was not designed to stick to plastic.

Finding a File

Even after finding the disk you need, you may still have trouble locating the particular file or program in. As my library of software has multiplied, my collection of clip art has too. I have so many graphics saved as brushes (for use with paint programs) it takes nearly ten seconds to list them, even using a hard drive. My screen graphics and word processing files (which I normally save to floppy disks rather than taking up space on my hard drive) now span dozens of different disks.

To get around the frustration and time-consuming chore of searching for a particular file by listing each directory one by one to the screen, I regularly dump them to my printer. Then I put the pages showing each disk's contents in a notebook. When I need a particular file I just scan the pages, insert the correct disk and input the correct directory and filename. Presto (or almost presto) I have the graphic or file I need on the screen ready to use.

If you are an Amiga user, you can list the contents of a disk to your printer by first making the system recognize that disk. Click on the CLI icon from Workbench to open a CLI window, and type either CD df0: or CD df1: (depending upon which drive contains the disk you want to list) and press RETURN. To dump the entire directory of a disk to your printer, just type DIR > PRT: (be sure to leave the spaces) and press RETURN. To list the contents of a particular drawer (dir), first CD "directory name" (e.g., CD C, CD DEVS, CD LETTERS, etc.) and press RETURN. Now type LIST > PRT: and press RETURN to print the contents. The > PRT: in each command redirects the content dump to the printer rather than the default device (screen).

Some DOS utility programs make printing your directories even easier. I regularly use *DiskMaster* for this purpose because it has an option with lets me selectively list and print directories using different type sizes. If you are using such a utility, check its options list for a similar feature.

If you are a Commodore 64 or 128 user you can list the contents of your disks to a printer by using these three lines:

```
LOAD "$",8
OPEN1,4:CMD1:LIST
PRINT#1:CLOSE1
```

To get these to work, do this: type LOAD "$",8 followed by RETURN (to load the directory of the disk in drive 8). Now type OPEN1,4:CMD1:LIST and press RETURN (to dump the directory to your printer—device 4). To redirect output to the screen instead of printer, type PRINT#1:CLOSE1 and press RETURN. This line dumps the contents of the buffer to the printer and closes the channel to the printer.

The time required to list the contents of the disks you use most often may seem to be a waste the first time you do it, but as your library grows and more files clog your disks the effort will quickly repay the time invested.

Favorite Fonts

If you are an Amiga user, you may still be wrestling with how to get your software to recognize or use different fonts. In our July 1988 issue I reviewed a font editor called *Calligrapher*, and while using it I learned a very simple method of getting selected software to recognize the fonts I wanted—and not just those stored on the system disk. For those who may have missed the suggestions in that review, let me repeat myself.

Each time you boot your Amiga, assignments are made which determine where the system looks for information. FONTS: is one of those assignments. Unless you change this assignment, the Amiga operating system will default to the boot (or Workbench) disk, to a directory named fonts.

If you are versed in AmigaDOS and using the CLI interface, you can direct the system to look elsewhere for fonts with the ASSIGN command. But a simpler method is to move as many fonts as your program (paint, publishing, video, etc.) can handle, onto one disk and name that disk "FONTS".

Because disks are given a higher priority than directories when the system looks for fonts, it will always recognize a FONTS disk rather than a FONTS directory. As soon as a disk named FONTS is inserted, the fonts stored on it become the usable fonts. You can have as many FONTS disks with different collections of fonts as you wish and choose between collections by simply switching disk. This is far and away the easiest way to use large collections of different fonts. But as always there are some dangers when simple solutions are used.

Problem One: If you were to insert two disks, both named FONTS, into two drives, your system would become completely confused and crash. The solution—DON'T DO THAT. Because the one problem this fonts scheme presents is so easy to avoid, I always use FONTS disks. In my opinion, the potential danger of this arrangement is easily outweighed by the benefit it offers.

Problem Two: If you aren't careful your fonts list may grow too long to be displayed by a pull-down menu. Some programs, including early versions of *DeluxePaint II,* will simply blank the screen if the pull-down menu touches the bottom of the screen. Even if the program does not crash, the information presented in the menu is useless, since you can not see to access it. This annoying possibility increases each time you add a new font to your font directory. The solution—limit the number of fonts on each disk to the number the screen window can hold.

Problem Three: The last problem surfaces when the font you want to use is on FONTS (disk X) and the software has already recognized FONTS (disk Z). With some software you can get it to look for a new FONTS by changing the screen display. Here's a tip from InterActive Softworks (developers of *Calligrapher)* on how to get *DeluxePaint II* to load a new list of fonts after it has already accessed a set: "Simply access the Screen Format selector. Each time you change bit-planes and/or resolution, *DeluxePaint II* flushes all its buffers including the one which contains the fonts list. So after you select Screen Format you can switch FONTS disks and use the new collection. Just clicking OK (no change of screen resolution is required) without changing anything about the size or color of your screen is enough to flush the buffers."

Other software may respond differently and allow you to introduce new fonts using different avenues. In an extreme situation, you might have to save the screen (with the fonts used in place) to disk, quit the program and begin again to get the software to recognize new fonts. Using the individual FONTS disk system, I have collected six different font-filled disks all named FONTS. On the label of each I display a sample of the typefaces each contains. In a special notebook I have a page with each font's name and samples from each stored on that disk. Each sample page displays the fonts the disk contains, printed samples of each font as well as the different sizes available. Each page is named 1–6 and each disk (remember they all are named FONTS) carries the corresponding number. I've found the only quick and reliable way to keep track of where fonts are located and how they appear is to refer to these printed samples.

After shuffling between the six different collections, I have finally selected 14 different fonts which I find I use most often. These fonts I have placed on one disk label simply "Favorite Fonts" (the disk itself is named FONTS), and nine times out of ten it is the fonts collection I turn to when I need a special font.

Safety First

Let me finish with a remark about safety. One of the most often-asked questions I hear from new computer owners is about how to safely use their system in a house which has old wiring—where holes in the electrical outlets are both the same size (you can't be sure at a glance which side is positive and which is negative). The real danger of such a situation comes when more than one outlet is used to supply electricity to different peripherals making up a system (computer, monitor, printer, disk drives, etc.). As long as the polarity of the outlets used is the same, your system should be safe, but because all those peripherals are wired into your computer, a reverse in one of those electrical currents could cook your system.

Short of getting an electrician to check and rewire your outlets, the cheapest and simplest solution is using an outlet strip (a couple of years ago they cost $30 to $80 dollars, but can be had for under $10 now). The one I use has six outlets (I use a different outlet strip for each of my four systems), a master switch, as well as a 15-amp fuse (which provides some surge protection). When you plug all your peripherals into that strip and the strip into a single outlet, a common polarity status is guaranteed. Another advantage is that you can turn all your devices on and off with a single switch—saving wear and tear on the peripherals, switches, and the 15-amp fuse supplies some protection against electrical surges.

Want More of Mr. Cheap?

I'm sure there are hundreds, even thousands of you who have found affordable, sensible solutions to those working and hardware problems with which we all wrestle. If so, why not drop me a note describing the problem and your solution. If I collect enough, I'll devote a future article to spreading the good news. If I think any of your ideas deserve to be covered in a detailed article I'll pass them and your name and address on to the editors—they are always looking for good article material. If you have a software hint be sure to send it to Louis Sander for his "Tips and Tricks" column. Send tidbits and cheap suggestions to:

Gary Fields
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destruction; E's make your Vaus larger; L's give your Vaus a laser with which to fire at blocks; P's award an extra Vaus; and S's slow down the ball. Knowing when to collect these capsules is the key to winning *Arkanoid.* In addition, gray bricks that require more than one bounce or laser hit and indestructible bricks make the game more interesting.

You might wonder why Discovery Software International put out an *Arkanoid* for the Amiga when Taito is releasing one too. Fetzer explains, "The president and CEO of Discovery, Rick Ross came up to us about a year ago at CES and said that he had the capability of doing *Arkanoid* on the Amiga. We decided that, because we were about a year or more away from entering the Amiga market, it would be a good experiment to license that game to Discovery. It created a good reputation for *Arkanoid.*"

That it did! *Arkanoid* was already a hit in the arcade, but the Discovery version added 33 more levels in addition to the original 33—you select which set you want to play. That version duplicates *Arkanoid* for the Amiga, and the Taito version does the same for the 64—and does it better because of the variety of input devices.

In the Taito version of *Arkanoid,* you can use keyboard, joystick, mouse or paddle. Because the original game used a paddle, I would find one or buy one to play the Taito game (it doesn't have to be a Commodore paddle—I used my Atari paddles). The joystick and keyboard are tough to use. The mouse is better, but the paddle gives the exact game play as the original. You can even switch devices between games—a nice touch. However, I noticed some discrepancies in the Taito version.

The indestructible bricks are not gold, as in the original. I really don't understand why that color wasn't used. That would be fine, except that the bricks are instead light blue—a color too easy to confuse with regular bricks. In the Taito version, D capsules split the one ball into three and also speed up all of them, unlike the original. This was unexpected. Finally, gray blocks spawn capsules, again unlike the arcade game. This was the only difference that annoyed me, although it makes the game easier. On the positive side, *Arkanoid* reflects the graphics of the original, down to the shadows of the Vaus and balls, as well as the music and sound effects.

Ratings:	
Graphics:	8.50
Music and Sound Effects:	9.00
Game Play: (with paddle)	10.00
Overall Rating:	9.38

Bubble Bobble

Bub and Bob are two dinosaurs out to ward off the attacks of a number of beasties as they make their way through 100 levels. *Bubble Bobble,* which was a number one hit in Europe for a number of months, places you in the role of one of the dinosaurs. In fact, in the Taito Software home version, two people can play at once. Fetzer was very proud of *Bubble Bobble*: "We expect it to sell 400,000 copies in the next few months for the Nintendo alone. The game has sort of a universal appeal. We think that we've captured everything that the arcade game has. I'm very upbeat on *Bubble Bobble!*"

Bubble Bobble lives up to Fetzer's claim. All of the fun, surprise and excitement of the arcade original lives again in Taito's Commodore 64 version. You guide your little dinosaurs around multi-leveled screens, trying to get rid of the monsters that are your enemies, while at the same time collecting the bonus items that are left behind after an enemy is killed and those that randomly appear around the screen. These bonus items, as well as the way you kill the enemies, are the secret to the success of *Bubble Bobble.* You kill the monsters by blowing bubbles that enclose them. As they float into the air, jumping on the bubbles or touching them bursts the bubble, destroys the enemy and leaves a bonus item (mostly food) to fall to the nearest ledge. By collecting this food and other bonus items, different things happen in *Bubble Bobble.*

Certain bubbles have symbols of fire, thunder or water in them. By touching them, the element inside follows you around to the bottom of the screen where it disappears, destroying monsters along the way. Certain targets like jewelry, crowns and gems appear only for a few short seconds but give a huge bonus.

Magic targets are most important, since they give you special powers. Some speed you up, others kill all monsters on a certain level, others make you invincible for a short time, and still others let you bypass a variable number of levels. One secret object takes you to a special screen. Catch these magic targets as quickly as you do the jewelry, et al.

Finally, certain bubbles contain one letter of the word EXTEND. By collecting these letters over the course of a few levels, you automatically jump to the next level and get an extra life. With all of these objects to collect and seven different enemies like Benzo, Bonner, Blubba and Boa-boa to watch out for, *Bubble Bobble* is more and more fun with each play.

Ratings:	
Graphics:	7.50
Music and Sound Effects:	8.00
Game Play:	9.00
Overall Rating:	8.38

Renegade

Renegade is the precursor to all of the other kick-and-fight games that appeared in the arcades last year. In fact, *Double Dragon* the sequel to *Renegade,* uses similar movements and a similar goal. You may have noticed that *Double Dragon* is available for the 64 from another company—not Taito. The situation is the same as *Arkanoid.* "We were just about to release *Renegade.* If we released *Double Dragon* at the same time, it would be a situation where two games would really be competing against each other," explained Fetzer.

I'm glad that Taito didn't put out *Double Dragon.* Instead, their concentration on the precursor to the Number One arcade hit took the pressure to deliver off them and allowed them to produce this great 64 version of *Renegade.*

In *Renegade,* you must fight four different street gangs and defeat their leaders before you are able to make your date with your girlfriend. Each gang has its own unique fighting personality, and your real goal is to discover how to attack each gang. The game play is very smooth and exactly the same as the arcade. This is the only Taito release that brought the benefit of having more than one button on the arcade game down to reasonable joystick movements on the 64. In *Renegade,* you must be able to jump, attack to the left and attack to the right. Taito condensed the work of three arcade game buttons onto the joystick.

The graphics are really good on *Renegade.* They help you to judge where your on-screen character is in relation to the gang members, so that you can line up shots correctly. The moves available are punching, back kick, flying kick, kneeing and punching a floored assailant. You'll find yourself executing these moves in no time. The only secret I can offer for *Renegade* is to find a wall in each level to back up against. While against the wall, you can get rid of the gang members without incurring damage yourself. In this way, you can save all of your energy for the gang leader. Fighting-game lovers will easily get addicted to *Renegade.*

Ratings:	
Graphics:	9.00
Music and Sound Effects:	7.00
Game Play:	9.00
Overall Rating:	8.50

Rastan

Let me say right off the bat that I consider myself a *Rastan* expert. I played the coin-op game every day for about two months until I finished it—all six levels. I'm not tooting my own horn, but just offering this information to give justification to the fact that I'm really disappointed with the way *Rastan* turned out. The graphics are bleak and the game play awkward—I'm really surprised that Taito was willing to put this game out for the 64. However, I'm positive the Amiga version will be a lot better.

In *Rastan,* you must move a sword-wielding Conan-type warrior through six levels that each have some wilderness to traverse and a castle at the end of the level, with one final super enemy to fight. You swing on ropes, jump in the air, kill monsters and collect gems and special items. Armor stops all damage for a limited time, poison depletes energy, a ram's head restores all energy, gems add bonus points, and rings speed up your weapon. There are a lot of different monsters too. In any case, you must try to make your way through the levels by gathering the items to help you along and by killing monsters to get more points to get an extra life.

The real problem with *Rastan* is the game play. In the arcade game, there are a jump button and sword button, in addition to the eight-direction joystick. By combining moves on the stick and presses of the jump button, you jump on and off ropes, ledges, etc. By condensing all movements onto the joystick, Taito took away an essential element of the game and made it nearly impossible to jump correctly, even for a seasoned pro like myself. I found that I had to relearn movements to survive. Taito has acknowledged this fact, Fetzer admitted, '*'Rastan* is not the easiest game in the world to play. When you have to swing across those ropes, there's only one way to do it to make it across." Unfortunately, this is true. One positive note is that after practicing jumps, you'll make it through levels quicker than you'd think.

Some specific points that need address-

ing are these inconsistencies with the arcade game: the bats move much too fast, the jumps onto ropes are the most difficult to make, the sword is too slow, you can't get off a rope quickly, and you can kill soldiers in the castles with one hit—unlike the original. However, I do expect some of these problems to be corrected in the Amiga version. The graphics are poor at times, yet great at other times. Better colors could have been used at some points in the game. Finally, you'll hear the exact music you did in the arcade—it gets real intense!

Ratings:

Graphics:	6.50
Music and Sound Effects:	9.50
Game Play:	6.00
Overall Rating:	7.00

Operation Wolf

Yes, folks, this is the one you have probably been waiting for the most, and your wait was not wasted. *Operation Wolf* for the 64 is as intense as the original game and certainly as fun. I'm sure you've heard this game in the arcade. It's the one with the gun that recoils and clicks and *rat-a-tats* its way through every game. Fetzer acknowledged, "The success of the arcade game really depended upon that machine gun—the sound of the machine gun and the recoil. We did as good as possible a job of getting around that. I think that the moving cursor with the mouse worked real well."

Indeed, the game did so well in the arcades that the sequel, *Operation Thunderbolt,* is already planned for release this year. In that game, you will scroll into the screen as you shoot the enemy soldiers, as opposed to the left and right in *Operation Wolf.*

In *Operation Wolf,* you must make your way through six different scrolling areas in an attempt to save the hostages captured by the enemy. As the screen scrolls, you must fire at soldiers, tanks and helicopters using a cursor as a target. You can move the cursor with either a mouse or a joystick, but I would only play *Operation Wolf* with a mouse. You won't get far with a joystick. You use bullets to hit the soldiers and grenades to destroy helicopters and tanks. As your supply diminishes, you can restock by shooting at cartridges and stray grenades that lie on the ground. In addition, if you shoot dynamite, all ground targets are destroyed. Power drinks restore energy that was reduced by enemy shots. Super bullets turn your single-shot gun into a high-speed automatic firing weapon for ten seconds. Aiming at all of these things on the screen can be difficult, but your reflexes will get a great workout.

Operation Wolf is almost exactly like the arcade game. One difference is the restocking screen that sometimes appears between levels to help you get your supplies back to normal. It is absent in the home version. One complaint that I have with the game is that it allows you to continue your game only once. The arcade game lets you continue as long as you feed it quarters. Future versions of the game should have this option installed. In any case, *Operation Wolf* gave me exactly what I expected and will keep all of you arcade soldiers happy at home until the sequel to the game is released in the arcades. This game turned out to be one of my favorite translations.

Ratings:

Graphics:	9.50
Music and Sound Effects:	9.00
Game Play:	9.00
Overall Rating:	9.13

Prospects

One thing I forgot to mention is the packaging for the games. Each game comes with full-color artwork on the front and a description of the game on the back, as any software does. Inside each game is a neat cartoon introducing the game and its purpose. These cartoons gave a little more atmosphere to the game and heightened my anticipation of playing. A nice extra, Taito!

Subsequent releases from Taito are likely to rely on mouse usage. As Fetzer explained, "The mouse gives a higher degree of accuracy and responsiveness." I certainly agree. In the two games that use it *(Operation Wolf* and *Arkanoid),* the mouse is the superior input device to the joystick. Which games will use the mouse in the future remains in the hands of the designers. I bought a Commodore 1351 mouse for the sole purpose of reviewing these two games, and I'm glad that I did.

By the time this article is printed, the Amiga versions of *Operation Wolf, Bubble Bobble, Renegade* and *Rastan* should be ready. As I've said before, I expect them to be virtually the same as the arcade games—even *Rastan.* Also, *Sky Shark* should be released for the 64, as well as the Taito classic, *Qix* (pronounced "kicks"). In *Qix,* you attempt to box in a strange moving shape by forming boxes of various sizes end to end. If you cover 75% of the screen with boxes, you go to a harder level.

I expect Taito Software, Inc. to achieve great success in the home software market this year. Their attitude is positive and, more importantly, their games are fun to play. What Taito plans for the future can best be expressed by Fetzer himself: "Our company started out in the arcades, and we will always dedicate ourselves to being a leader in that business. That will never change. What we are doing—and we'll start to see some of this from Taito this year—is introducing games that have been developed for the home market only. That will be a big change for us rather than just selling arcade games. We're attracting enough attention right now that a lot of people are approaching us with games and licensing deals. We'll always be looking for something that's breaking new horizons. A lot of products never see the light of day because we're trying to be a leader in the industry. We've got a good reputation at stake. As we've come to the market here, we've tried to emphasize quality—that's a big part of our operation."

I would like to thank Alan Fetzer for his time to talk with me for this article, as well as Anita Deiter for setting up the interview and sending me ample information on Taito and the games.

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Detroit, in city parks, and even at city hall. Players can blast their human and mechanical foes with Robocop's own special-issue Auto-9 gun, or punch, kick and jab their way to victory. Whatever the case, *Robocop* has excellent graphics and multiple levels of play, and the scenes are patterned after scenes from the movie. This early spring release should prove to be very popular.

Epyx

64: And now for something totally different! The Yellow Shadow, a treacherous alien race, is setting up an empire beneath the sea. I believe they could actually accomplish this mission if not for the *Undersea Commando*. Your assignment consists of locating and destroying these alien fiends, who have no concern for human life. In the program, the player is the commander of a modern submarine (equipped with an arsenal of state-of-the-art weapons and sophisticated detection gear). When you encounter attacking enemy patrols, use the hydro-scooter to outmaneuver your enemies. If taken by surprise, be prepared to go one-on-one with alien assassins or creatures from the deep. *Undersea Commando* is a fine blend of excellent graphics, superior challenges and above-average arcade action. Look for this exciting new product when the magnolias are in bloom.

Trials of Honor, another spring release, takes place during the dark ages of Europe. Your beloved monarch has been slain, and his killer now sits upon the throne. You are a brave young hero, setting off on a quest to unseat this false ruler. Along the way you'll encounter evil kings, brave knights, powerful wizards and the local peasants. Players participate in realistic swordplay, arm wrestling with powerful opponents, and gambling for gold. You can even try your hand at military strategy. After slaying the demons that protect the Labyrinth, it's time to face the man with the crown. *Trials of Honor* is a true test of one's strength, wisdom and ability to deal with the unexpected.

Coming later in '89: Numerous microcomputer journalists have speculated on what Epyx's *hardware* team is developing. Even though I haven't seen the product, I can tell you it's not an artificially-intelligent disk notcher or a professional-quality mouth soaper (for writers who love to taunt the public). But I will make a commitment here. Watch future issues of *Commodore Magazine* for a revealing look at this top-secret project. I plan to interview the guys who are putting this thing together, so stay tuned for developments.

First Byte

Amiga: *The Rhyming Notebook,* an invaluable tool for rhyming enthusiasts, is slated for shipment in March/April. This program is an incredible writing tool, that lets the user keep words and ideas on a software notepad and print out the final text. The program is very friendly and contains an extensive rhyming dictionary. Users also have the ability to hear the words and text spoken. I liked *The Rhyming Notebook* because it allows you to concentrate on the creative end of writing, while the computer takes care of the mechanics of the job.

The Storyteller will be coming your way in April. Many years ago, storytelling was a respected profession. Every community had someone who told exciting tales and legends that had been passed down by word of mouth. Now you can become the master storyteller of the '80's. You have the option of selecting or writing a special tale. Then you can choose a storyteller to speak the part. The program also contains a library of stories, interesting animated graphics, writing aids, planners and notebooks. *The Storyteller* includes everything a young author needs to write and perform his tales on the screen.

Lucasfilm Games

64: Now here's a bit of interesting news! *Indiana Jones and the Last Crusade* will be available in computer stores later this spring. Believe it or not, the game will be available for most microcomputer systems at the same time—within a few weeks of the movie's release. Lucasfilm Games won't talk about the project, but I managed to obtain the following information.

First of all, the program will be a fast-action arcade game which won't be a remake of an existing game. This special project will also contain elements from the upcoming *Indiana Jones* movie. They include: Nazis, tanks, horseback riding, etc. I'm keeping an eye on this project because *Indiana Jones* is a strong license, and Lucasfilm Games has an impeccable reputation.

Amiga: If you're interested in WW II Pacific theater aircraft, buy a copy of *Battlehawks 1942*. The program contains authentic simulations of American and Japanese aircraft. These include: F4F Wildcats, A6M Zero fighters, SBD Dauntless, D3A Val dive bombers, TBF Avengers and B5N Kate torpedo bombers. Select a plane and participate in four historic battles (Midway, Coral Sea, the Eastern Solomons and the Santa Cruz Islands). *Battlehawks* also features about a dozen training missions, over 30 combat missions, realistic flight dynamics, and four points of view. The arcade-style graphics are equally impressive, while the weapons operate like the real things. You can even watch an instant replay of your last assignment. In short, *Battlehawks* is an excellent recreation of vintage air combat, in which you can become the top pilot and advance in rank on either side. This high-flying program will be coming in for a landing early in the second quarter.

Medalist International

Medalist International is a new division of MicroProse that's about to make its presence known. The new company will market software under five different lines: Paragon, MicroPlay, Software Simulations, Hewson Consultants and Loriciels.

64: Paragon Software has a number of exciting announcements to make. Web slingers and shield throwers unite! Spiderman and Captain America are preparing to face *Dr. Doom's Revenge*. Doom, the mad dictator of tiny Latveria, has surfaced again to stir up trouble in the world. This time he's stolen a nuclear missile and plans to launch it at New York City if America doesn't agree to become a colony of his country. The U.S. sticks to its policy of not negotiating with terrorists, so Spiderman and Captain America have gone to Dr. Doom's castle to thwart his crazy scheme.

As the game begins, our heroes split up at the entrance of the structure. Spiderman initiates a search for the missile silo, while his partner goes after the mad genius himself. Will Dr. Doom triumph over our heroes? Their fate is in your hands. The game itself is primarily an interactive comic book containing over 20 action-packed battle scenes.

Several other villains are also present in the castle: Boomerang, Machete, Rhino-Man, Batroc and the evil Electro. Each character uses his special super-human powers to protect his master. Electro hurls massive bolts of lightning, while the Rhino-Man charges his foes just like they do in Marvel Comics. After you've worked your way through this gauntlet of super villains, you still have to settle things with the mad doctor (and I don't mean Pepper).

Dr. Doom's Revenge also contains a special Marvel comic book written to support the software. It should be an instant collector's item. I like the program because it's a fast-moving arcade game featuring many of the Marvel characters I've loved and hated over the years. If I were a betting man, I'd definitely wager twenty on the success of this mid-June release.

Has anyone seen the *X-Men?* Super villains are on the prowl, and a team of super heroes is needed to put them in their place. The storyline of this unique confrontation hasn't been revealed, but the *X-Men* program is going to be another Paragon arcade game featuring more role-playing elements than *Dr. Doom's Revenge.* Gather your favorite mutants together and attack the opposition sometime this fall.

Now we come to *Traveller 1: The Zhodani Conspiracy.* Traveller is a sci-fi fantasy role-playing game system (second in popularity only to TSR's Dungeons and Dragons). During the holiday season, *Traveller 1* will be coming to a monitor screen near you. In the distant future, mankind has finally reached the stars. He's set up a huge empire, and his Imperium has ruled it for a thousand years. As the empire expanded, the governing body was strained to the limit. Then disaster struck. The Emperor was slain, leaving no immediate heir or clear-cut successor. The Emperor's nephew believes he's the rightful heir, but so does his cousin. Even the assassin has a legitimate claim to the throne. With all of this confusion, several border areas have abandoned the Imperium and declared their own independence. Neighboring interstellar powers have begun to absorb outlying settlements. The mighty empire has crumbled. *Traveller 1: The Zhodani Conspiracy* is a graphic role-playing adventure game unlike anything you've seen to date. It's fairly complex and allows you to participate in 3D space combat. I'm sure this product has a bright future.

In April MicroPlay will release their first two Commodore 64 titles: *Keith Van Eron's Pro Soccer* and *Destroyer Escort.* The former is an incredible soccer program developed in Great Britain that allows you to do things no other soccer program can do. You can now perform microcomputer banana kicks and tackles. If you haven't heard the term "banana kick," it's the act of putting spin on the ball, so it curves around a defender or possibly even the goalie. Banana kicks add spice to the basic scheme of things, while permitting you to instigate some sneaky shots on goal. In regulation soccer, "tackling" is the maneuver where you slide at your opponent and try to steal the ball. I understand this program also contains detailed graphics and a variety of sounds.

I'm really looking forward to playing *Destroyer Escort* because it's basically the flip side of *Silent Service* (you escort WWII convoys across large bodies of water). There are four points of interest in the program: United States, Great Britain, Gibraltar and Murmansk (USSR). Each convoy contains five ships, and you have the option of traveling six different routes. You can patrol from the United States to Great Britain, from Britain to Gibraltar, from Murmansk to Britain, from Britain to the U.S., from Gibraltar to Britain or from Britain to Murmansk. Your vessel comes equipped with the following armament and equipment: a five-inch deck gun, an anti-aircraft gun, depth charges, torpedoes, radar and sonar. The other side has surface vessels, submarines and squadrons of aircraft. *Destroyer Escort* also displays five different screens: navigation, a map of the patrol zones, damage control, statistics and a view from the crow's nest. Score points for surviving the journey, for each surviving ship in the convoy, and for enemies damaged and destroyed. By the way, your foes have total air superiority—you don't have a single aircraft to your name.

I'm giving *Destroyer Escort* a thumbs up for its nice mixture of arcade action, some strategy and the thrill of the hunt (or being hunted). You never know what will happen next.

"Play ball!" *Pure Stat Baseball II* from Software Simulations is warming up in the bullpen. This spring release has better graphics than its popular predecessor and allows you to play in a number of different stadiums. The 1988 big league statistics are available on a separate disk.

Hewson Consultants is a British firm that specializes in "intelligent arcade games" with strong graphics and sound. The first three U.S. releases from Hewson will be fast-paced arcade games: *Netherworld, Exolon* and *Eliminator.* These titles will be available in May.

Amiga: The 16-bit version of *Dr. Doom's Revenge* should be available by August. *X-Man* and *Traveler 1* will probably be released in Amiga versions early in 1990.

Amiga armchair coaches can call all the shots in Software Simulations' *Pure Stat Football* later this fall. Create-your-own-team disks and 1988 team statistics will be sold separately. You can hear a number of sounds in the game (including the thunderous roar of the crowd). If you think you're smarter than that "bum" who coaches your favorite team, walk a mile in his shoes. Play *Pure Stat Football.*

MicroPlay's *Keith Van Eron's Pro Soccer* will also be ported to the Amiga.

The Hewson titles mentioned above will also be released for the Amiga in May.

Another European link in the Medalist family is the French firm Loriciels, known for their arcade and fantasy programs. June will bring three new Amiga releases under the Loriciels label. *Sapiens* is an arcade adventure that takes place 100,000 years ago. The game boasts over three *million* screens generated by algorithms of fractals.

Loriciels' *Mach 3* puts you in a super outer space vessel on an arcade mission to destroy the evil mutant sorcerer who has cast a fatal spell over your own dear Gwendoline.

Albedo is another Loriciels Amiga release to look for in early summer. It's an arcade laser duel against various monsters in a labyrinth, the end of which holds the ultimate secret of Albedo.

MicroIllusions

Amiga: Amiga 2000 owners, I can predict your future by consulting the cards. Three cards to be precise: MicroIllusions' frame buffer card, genlock/mixer card, and new digitizer card. These items and other hardware products will be marketed under the new Color Qube affiliate label.

The frame buffer is a 16-bit plug-in card. It devotes five bits of memory to each the primary colors (red, green and blue), giving the consumer 32,896 additional colors. The sixteenth bit is a special-effects bit that works in conjunction with the other cards. The frame buffer is required to use the other add-on cards.

MicroIllusions' genlock/mixer is a standard genlock product, an encoder, and much more. In case you aren't familiar with the term, "genlock" refers to the merging of an Amiga video display with an external video display. A good example of this technology can be seen on the evening news. They love to combine video from the real world with computer graphic titling. MicroIllusions' genlock/mixer accepts three different video sources: (1) external material, (2) the frame buffer card and (3) the Amiga itself. You can also display any combination of these three sources, overlaying one on top of another. One more thing: the genlock/mixer has a Super VHS output.

The digitizer generates professional-quality material. It can grab an image in real time, on the fly so to speak, or from a moving video tape. The card is very fast and can digitize images directly to the frame buffer (allowing you to work with approximately 32,000 colors). All three cards should be available during the April/May time frame.

On a lighter note, MicroIllusions plans to unveil *Dr. Plummet's House of Flux* late in the second quarter. This program is an outer space shoot-'em-up, in which you have to rescue six astronauts before you can advance to a more difficult level. The pull of gravity also plays an important role in the game. The force of gravity differs from level to level (28 levels, in all). Sometimes there is no gravity; sometimes gravity is centered on different parts of the screen. So reduce your foes to particles, but don't forget the gravity of the situation.

The Jetsons action game will be in consumers' hands about the same time.

MicroProse

Amiga: *Gunship* is coming to a store near you this summer. The program is pretty much the same, except it now contains enhanced graphics, sounds and music. The cockpit also has more details.

Later this fall, MicroProse will introduce an updated version of *Pirates*. They tell me it's something really special.

MicroProse is also said to be working on another fall release that's worth waiting for—the Amiga version of *F-19 Stealth Fighter*. The program was so successful in other formats (originally as *Project: Stealth Fighter* for the 64), that an Amiga version is now in the works.

Coming in 1990: During the early days of the new year, watch for the 64 version of *Samurai*, an adventure role-playing game. In many respects, it's an oriental version of *Pirates*. The personalities of the non-player characters are very sophisticated. They're controlled by the computer and take action on their own. In other words, something can be happening over the hill in the next province that can directly affect you and your future plans. You'll occasionally get news from the outside world. I hear the graphics will be great, and the strategy factor is incredible.

Mindcraft Software

64: *The Magic Candle* is the first release from Mindcraft Software, a company founded in January of this year. I'd like to welcome Ali Atabek, Ugur Atabek and Jim Thomas (founders of Mindcraft) to the microcomputer software industry.

Getting back to *The Magic Candle,* it exists in a mystic realm (inhabited by goblins, elves, wizards and the like). Untold ages ago, Dreax, the terrible arch-demon of the world was imprisoned within the flame of a magic candle. A mysterious group of guardians took possession of this item and watched over it for many years. Now the guardians have vanished, and the candle has started to melt. If the candle burns out, Dreax will be free to launch a massive campaign of death and destruction. Encouraged by recent developments, the demon-lords have begun an invasion of the lands of Deruvia. After evaluating the situation, you organize a band of adventurers who can help you find a solution to your problem. No one knows where this ancient information can be found, so be prepared to search every corner of the planet. Then there's the matter of dealing with monsters that tend to appear when you least expect them. So do your job well, my loyal friend, and Deruvia might survive this terrible ordeal.

I'm impressed with *The Magic Candle* for several reasons. First of all, the program has a large area to explore (featuring 54 dungeon levels, two castles, six towns and six villages). There are 26 types of monsters to battle and 24 magic spells to master. The animated combat system allows you to see yourself swinging swords, throwing fireballs, becoming invisible and jumping to avoid being hit. You can also carry on a lengthy conversation with any of the characters in the game. There will definitely be a sequel to *The Magic Candle* in the near future, but look for chapter one of the story early this spring.

Psygnosis

64: *Captain Fizz Meets the Blaster-trons* is another arcade game masterpiece. Even though the program's graphics are limited, the strategy factor more than makes up for the loss. The game has 22 levels, simultaneous two-player action, and a split-screen perspective to enable you to see what both players are doing at any given moment. *Captain Fizz* is extremely addictive, so use this April release sparingly (if you know what I mean).

Ballistix will also be available in the spring. This fast-moving program is basically a marble game, where you shoot small balls into a large ball (moving it down the field and into a goal zone). *Ballistix* also features unusual sound effects, as well as one- and two-player options.

If you enjoy slaying your share of wicked individuals, take your best shot at *Baal* (the supreme god of evil). *Baal* is a unique arcade game, featuring eight-way mobility, ultra-smooth scrolling, three distinctive realms to explore, and many levels of play. Psygnosis has crammed over 100 monsters and 400 traps onto the disk.

As our story begins, you are the leader of the Time Warriors (a well-trained futurist strike force). Baal is on your hit list because he's stolen the components of a mighty war machine. When activated, this weapon could end civilization as we know it. So you've got to get it back. This means a full-scale invasion of the dark lord's domains. Two of these realms contain all 18 components of the war machine, which must be assembled before advancing to the third domain and facing the wrath of Baal. Will you have enough strength left to slay your powerful foe? Play the game and find out. *Baal* will unleash his attack on humanity early in the second quarter.

Amiga: *AquaVentura,* coming to the market in May, is a new type of arcade game. In the program, you're the pilot of a sophisticated aircraft that can blast targets above and below the sea. Your enemies are composed of three-dimensional cubes, spheres and other figures. Fire at one of these characters, and literally destroy it piece by piece. This may sound easy, but everything happens in real time, and your opponents don't just sit there waiting for you to defeat them. The music is great, the 3D graphics are excellent, and I liked the use of soft coloring in the game. Combined, these features make for an exceptional program that is unlike anything you've seen before.

During the summer months, Psygnosis plans to introduce a half dozen Amiga titles to the public. One of these games is called *Chariots of Fire,* a chariot race simulation with an incredible sound track.

Spectrum HoloByte

64: Two long-awaited programs will be hitting the market early this summer. *Falcon,* the F-16 flight simulator, is almost ready for take-off. The aircraft features an authentic representation of an F-16 cockpit, and it carries enough firepower to knock out targets on the ground or in the air. I'm also pleased with the maneuverability of the craft. Apparently the U.S. Air Force was equally impressed because they will be using software based on the

program to train some of their pilots.

PT-109 is another interesting military simulation. John F. Kennedy was the captain of this now-famous vessel, and you have the opportunity to follow in his footsteps. This realistic WWII patrol boat comes equipped with torpedoes, cannons, submachine guns, depth charges, etc. Use your weapons to destroy enemy submarines and aircraft as you search for battleships and other large menacing vessels. The program also features night and day scenarios, four areas of action and approximately 45 missions typical of the period. *PT-109* seems to be very realistic and historically correct.

Amiga: Spectrum HoloByte is out to drive you crazy! They're currently developing an untitled down-to-earth racing simulation. The object of the program is simple: drive as fast as you can over a special course. Beware of the police and don't hit someone or something along the way. It's interesting to note that all of the courses in this program are located in the San Francisco area. One course, for example, takes you through the heart of the Chinatown District, while another allows you to drive across the Golden Gate Bridge. Whatever the case, you will be competing against veteran drivers of these raceways. San Francisco landmarks like the Trans America Pyramid, the Coit Tower and cable cars are also present in the game. Then you have the lesser-known Bay Area landmarks: pedestrians crossing against the lights, animals running loose and, of course, the infamous double-parked trucks.

Cars in the program are equally realistic. Each vehicle has its own dashboard, occupying one third of the screen. Dashboards contain all the gauges and instrumentation you'd expect to find on the real thing. Players actually see the steering wheel move when they turn a corner, the gear shift moves as they shift, and even the turn signals operate realistically. As you look through the windshield, you see yourself driving between the buildings of the city. You can also look through either window and even out the rear. We're dealing with a total car here! If you like driving fast, but can't afford the tickets, this summer release is just for you. I recently saw a demo of the product, and it really looked great.

Coming Later in 1989: The Electronic Battlefield Series should begin to hit the market by early fall. *Falcon* for the Amiga was Spectrum HoloByte's first modem-compatible release. Now you'll see a whole line of modem-compatible military simulations. For example, if I had a tank and you had a jet fighter, we could work together to beat a common foe. New game scenario disks will also be coming out. Each disk will probably generate a specific type of terrain and a generic situation. Don't expect to see anything like Libya 1989; Spectrum HoloByte doesn't believe that promoting hostilities against a specific country would serve a useful purpose. When it comes to having fun, I believe these new Amiga programs could re-define the word.

SubLogic Corporation

SubLogic is the subject of a lot of rumors these days. Some folks say they've had massive layoffs, while others believe the company is definitely going under. I recently spoke with Deborah Israel, director of promotion at SubLogic, to find out the facts of the matter.

Jermaine: Is SubLogic going through changes?
Israel: That's an understatement! On November 17, 1988, we announced a restructuring of the company. SubLogic had geared up to become a publishing house. We were soliciting outside submissions, starting a new sports line, marketing a home accounting package, etc. Unfortunately, sales didn't justify a continuation of this new venture. So we backed off from that route and returned to what we knew best—the development and marketing of flight-related products. This meant certain positions suddenly ceased to exist. There were 18 permanent layoffs, but we're alive and well and doing fine.
Jermaine: Tell me about your new product line.
Israel: Our people are currently finishing up an Amiga version of *Scenery Disk #9*, covering the St. Louis, Chicago and Pittsburgh area. It also features a number of popular landmarks including the Gateway Arch, the Indianapolis Speedway and the location of SubLogic (in Champaign, Illinois).

In April or May, we plan to release the *Hawaii Scenery Disk* for the Amiga. This product displays the shore line of every island, mountains, Diamond Head, Pearl Harbor and other points of interest. Have you heard of the Bermuda Triangle? The *Hawaii* disk features a similar phenomenon. When you enter a certain region of the map, strange things begin to happen. It's a real challenge just to figure out exactly where you have gone. So *Hawaii* is a detailed scenery disk, like the others before it, with an additional game thrown in for fun.

Now we come to our top-secret project. SubLogic is currently developing a unique form of flight simulator. It's not a conventional aircraft and unlike anything most of us have seen before. The vehicle is very fast, and I don't know what kind of firepower it carries. This program will probably be available later this year.
Jermaine: What's going on at the company right now?
Israel: One product after another is coming down the pipeline. Since our staff is smaller, everyone has to work a lot harder these days. Other companies have laid people off, and most of them are still around. So don't believe everything you hear about our demise. We're in business for the long haul. ■

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Notice the labels on the number keys 1–8 in the top row of keys. Each key is labeled with two colors, one above the other. When one of these keys is pressed while COMMODORE is held down, the cursor changes to the lower color.

For most keys not mentioned above, the COMMODORE key has the same effect as the SHIFT key.

The CTRL or CONTROL key works like the COMMODORE key with the number keys 1 through 8, except it produces the color on the top of the label. When used with the 9 or 0 keys, it enables or disables the reverse field (RVS) mode.

With the alphabetic keys A–Z, CTRL produces a CHR$ code equal to the position of the letter in the alphabet. [CTRL A] produces a CHR$(1), [CTRL B] produces a CHR$(2), and so forth.

ALT is rarely used in Commodore computing. If you ever encounter it, just remember to press it first, and while it's down, to press the other key in question.
Louis F. Sander
Pittsburgh, PA

All About the ESC Key: This key, found on the 128 but not the 64, works differently from the other keys mentioned above. When it's used in conjunction with other keys, it is pressed, then released. The other key or keys are then pressed in sequence. Unlike SHIFT, CONTROL and ALT, ESC is not held down while another key is being pressed.

ESC, also called Escape, sends its own character code, CHR$(27). One frequent use of that code is with printers, where it readies the printer for other special codes that follow. Another use is for screen-editing commands in 128 mode. These commands are too numerous to be covered here, but they're explained in your *128 System Guide.*
Louis F. Sander
Pittsburgh, Pa

Notes on Magazine Programs: When typing a program from a magazine, it's always useful to include a REM that identifies the magazine, issue and page number. That way you can easily return to the source.

But sometimes the BASIC program you type in is used to create a machine-language program, which is the one that you later load and SYS to. In these cases, your REM statement may be discarded or filed away with the original BASIC that you never refer to again. How, then, can you retain a reference to the original magazine article?

I do it by making a BASIC loader for my machine-language version. If the loader includes the SYS call, I have two advantages: I can always get back to the source, and I don't have to remember the SYS.

Here's a typical BASIC loader for use in those cases. In our example, the machine language program is named MLP, and it's enabled by a SYS 49152:

```
10 REM COMMODORE MAGAZINE, 5/89, PAGE 77
20 A=A+1
30 IF A=1 THEN LOAD "MLP",8,1
40 IF A=2 THEN SYS 49152 : NEW
```

Variable A is needed because of a peculiarity in Commodore BASIC. When a BASIC program is finished loading a machine-language program, the computer executes the BASIC program again, this time without resetting variables. In the example shown, line 30 will execute when the program is run from the keyboard. When the computer re-runs the program, A will be incremented again and line 40 will execute.
John C. Burt
Wolfeboro, NH

Moving Files: This program reverses the positions of two programs on any formatted disk. This is very useful when you want to put one program as the first one in the directory, where it can be easily loaded by using an asterisk as the filename in the LOAD command.
Dean M. Yamada, Jr.
Temple, TX

```
100 PRINT"[CLEAR,RVS,SPACE4]
    MOVING FILES - DEAN YAMADA, JR.
    [SPACE5]"
110 OPEN 15,8,15
120 PRINT"[DOWN2,SPACE2]
    INSERT SOURCE DISK WITH FILES TO"
130 PRINT TAB(12)"BE SWITCHED[DOWN]"
140 PRINT TAB(10)"ENTER Q TO QUIT
    [DOWN2]"
150 PRINT"ENTER NAME OF FIRST FILE TO
    SWITCH":INPUT N$
160 IF N$="Q" THEN END
170 PRINT#15,"C0:MOVE=0:";N$
180 PRINT#15,"S0:";N$
190 PRINT#15,"R0:";N$"=0:MOVE":PRINT
200 PRINT"ENTER NAME OF SECOND FILE
    TO SWITCH":INPUT A$
210 IF A$="Q" THEN END
220 PRINT#15,"C0:MOVE=0:";A$
230 PRINT#15,"S0:";A$
240 PRINT#15,"R0:";A$"=0:MOVE"
    :CLOSE 15
```

64 Operation SPICE: "SPICE" is short for SPies on ICE—the slippery kind. You've just delivered some important documents on the icy slopes of Siberia, and the KGB is hot on your trail. You leap into your snowmobile and start your escape, when you discover two disturbing realities.

First, the KGB has missiles to launch at you. Second, the snow is melting, exposing small patches of grass and dirt. Too bad you can't turn back.

Your controls are simple— < to go left and > to go right. You do not need to shift them. Collide with a missile or a patch of grass and you're history.
Steve Harney
El Paso, TX

```
100 REM 64 OPERATION SPICE-STEVE
    HARNEY
110 POKE 53280,1:POKE 53281,1
    :PRINT"[GREEN,CLEAR]":V=53248
    :POKE V+21,3:POKE V+23,2
120 POKE V+29,0:POKE 2040,13
    :POKE 2041,14:FOR J=854 TO 1023
    :POKE J,0:NEXT
130 FOR D=0 TO 23 STEP 3:READ Q,R
    :POKE 832+D,Q:POKE 896+D,R:NEXT
140 POKE V+39,6:POKE V+1,128
    :FOR D=1 TO 25
150 PRINT:NEXT:TI$="000000":X=171:Z=20
160 A=INT(RND(1)*19)+1:B=20-A
```

```
170 PRINT"[SPACE7,CMDR W,GREEN]";
    SPC(A);"[CMDR V]";SPC(B);"[BLACK,
    CMDR Q,SPACE10]";:POKE V,X
180 GET M$:IF M$<>"." AND M$<>",
    " THEN M$=N$
190 IF N$="," THEN X=X-4:L=2
200 IF N$="." THEN X=X+4:L=-2
210 POKE V+3,Z+5:B=PEEK(V+30)
    :C=PEEK(V+31):IF Z=250 THEN 250
220 N$=M$:Z=Z+10:IF Z>250 THEN Z=250
230 IF (B>0 OR C=1 OR C=3) AND Z>49
    THEN 260
240 POKE V,(X+L):POKE V+3,Z:GOTO 160
250 POKE V+2,X:Z=50:GOTO 220
260 S=INT(TI/10)*10:FOR D=1 TO 200
    :GET M$:NEXT
270 PRINT"[CLEAR]GAME OVER!"
    :PRINT"SCORE=";S:WAIT 197,5
    :GOTO 140
280 DATA 093,065,093,099,127,127,093,
    028
290 DATA 073,062,028,062,008,028,008,
    008
```

64 Under Fire: "Captain, we have just entered the Odgart 5 system."

"Any reaction from the planet surface?"

"Not at this time—wait! We are being fired upon!"

"Shields up! Go to Yellow Alert!"

"Sir, all shield and defense mechanisms have been jammed!"

"Red Alert! Our only chance is to outmaneuver them . . ."

You are the ship's last hope. As the battle pilot and helmsman, your duty is to get the ship out of the range of enemy missile fire. You sit back at the controls, poised and alert to react to any obstacle. Control your ship with the < and > keys, and cross the screen alive, if possible. If you make it, you'll get 500 points and be returned to your starting position. Make it across as many times as possible, and be advised that the ship moves slowly in reverse.

Steve Harney
El Paso, TX

```
100 REM 64 UNDER FIRE - STEVE HARNEY
110 POKE 53280,0:POKE 53281,0
    :PRINT"[CLEAR,RED]"
120 V=53248:POKE V+21,1:POKE 2040,13
    :POKE V+1,100
130 POKE V+23,0:POKE V+29,1
    :FOR J=6 TO 20 STEP 3:READ K
    :POKE 832+J,K:NEXT
140 X=10:POKE V+16,0:POKE V,X:SC=0
    :FOR J=1 TO 25:PRINT:NEXT
150 GOSUB 220:IF X<50 AND R=0 THEN
    SC=SC-1
160 Z=INT(RND(1)*37)+3:PRINT SPC(Z)"
    [CMDR G]"
170 GOSUB 220:W=PEEK(V+31)
    :IF W=0 THEN 150
180 POKE 2040,36:FOR J=1 TO 250:GET M$
    :NEXT
190 PRINT"[CLEAR,WHITE]SCORE ";SC
    :PRINT"HI[SPACE4]";HS;"[RED]"
200 WAIT 197,5:PRINT"[CLEAR]"
    :IF SC>HS THEN HS=SC
210 W=PEEK(V+31):POKE 2040,13:GOTO 140
220 GET M$:IF M$<>"," AND M$<>"."
    THEN M$=N$
230 X=X+3:SC=SC+.5:R=PEEK(V+16)
    :IF M$="," THEN X=X-4
    :IF X<10 AND R=0 THEN X=10
240 IF X>90 AND R=1 THEN SC=SC+500
    :FOR J=1 TO 500:NEXT:POKE V+16,0
    :X=10
250 IF X>90 AND R=1 THEN POKE V,X
    :GOTO 280
260 IF X<=1 AND R=1 THEN POKE V+16,0
    :X=254
270 IF X>=255 THEN POKE V+16,1:X=1
280 POKE V,X:N$=M$:RETURN
290 DATA 112,186,47,66,248
```

No-list Lines: Programmers are notorious for wanting to keep certain lines or parts of lines from listing onto the screen. Ever wonder how they do it? On the 64 or 128 just follow these steps:

1. Add a colon, REM and two quotation marks to the end of any BASIC line.
2. Delete the second quotation mark.
3. Go into reverse mode by typing [CTRL 9].
4. Add a T for every character you want to disappear from the end of the line. When you list the line, you'll see the effects of your work.

Mike Prestwood
Milpitas, CA

CP/M Directory Magic: You can use your file editor to protect CP/M files from accidentally being deleted. Just find the file in the directory, and modify its extension by adding $80 hex to the ASCII value of its first letter. (This is equivalent to shifting the first letter of the extension.)

If you make this change to a COM file, for example, the ASCII of the first letter will change from $43 to $C3.

You can bury the file from prying eyes by putting the shifted character into the second byte of the extension. In this case, the hex for COM changes from 43 4F 4D to 43 C3 4D.

Pamela Knapp
Calimesa, CA

64 Lockup Trick: In direct mode, type POKE 120,0 and press the RETURN key. Everything will look all right, but your keyboard will be completely useless. To prove it, type a command and press RETURN. The cursor will move to the start of the next line, but the command will not be executed.

STOP/RESTORE will appear to correct the problem, but you'll still find that the computer is effectively locked.

Wilson Lee
Canton, MI

1581 Partitions: When moving to and from a partition, or when moving from one partition to another, always do a DCLEAR. Once you have accessed and loaded a file and you want to access a file in another partition, just enter DCLEAR and press F3 for your directory. You'll find yourself back in the main directory.

Pamela Knapp
Calimesa, CA

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

"[HOME]" = UNSHIFTED CLR/ HOME	"[PURPLE]" = CONTROL 5	"[F1]" = F1
"[CLEAR]" = SHIFTED CLR/HOME	"[GREEN]" = CONTROL 6	"[F2]" = F2
"[DOWN]" = CURSOR DOWN	"[BLUE]" = CONTROL 7	"[F3]" = F3
"[UP]" = CURSOR UP	"[YELLOW]" = CONTROL 8	"[F4]" = F4
"[RIGHT]" = CURSOR RIGHT	"[ORANGE]" = COMMODORE 1	"[F5]" = F5
"[LEFT]" = CURSOR LEFT	"[BROWN]" = COMMODORE 2	"[F6]" = F6
"[RVS]" = CONTROL 9	"[L. RED]" = COMMODORE 3	"[F7]" = F7
"[RVOFF]" = CONTROL 0	"[GRAY1]" = COMMODORE 4	"[F8]" = F8
"[BLACK]" = CONTROL 1	"[GRAY2]" = COMMODORE 5	"[POUND]" = ENGLISH POUND
"[WHITE]" = CONTROL 2	"[L. GREEN]" = COMMODORE 6	"[SHFT ^]" = PI SYMBOL
"[RED]" = CONTROL 3	"[L. BLUE]" = COMMODORE 7	"[^]" = UP ARROW
"[CYAN]" = CONTROL 4	"[GRAY3]" = COMMODORE 8	

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs!

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT. .) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
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END

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5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59382 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
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END

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Impossible Mission 2: To find music pieces that can be played on the stereo, first locate the first aid cabinets. You'll find one first aid cabinet/music piece somewhere in each tower. Six music pieces will complete the song. You can't search a first aid cabinet until you blow it open with a bomb.

If you enter a completely darkened room, push in the direction opposite the one you came in from. It takes a while.
Jeff Kropf
Denison, IA

Jet Boys: Memorize the aliens' patterns, as they are the same every time. When fighting an Ultra Beast, move as close to it as possible. Good timing and control of the joystick will make this game easy.
Derek Godat
Terre Haute, IN

Jinxter: To open a mailbox, you have to warm up to the solution. Make sure you warm up twice. Be there to answer the phone in your friend's house. Listen to the birds and smell the flowers.
Scott Nicholson
Ft. Gibson, OK

Karnov: If you're playing for the first time, use your ladder and jump around a lot. If you're wondering how to get the options to work, just press the "Y" key.

In the Rocky Hills stage, destroy the two little jumping rock men, but don't be afraid to jump down the hole. Your courage will be rewarded by a bunch of K blocks. If you jump around down there, you can also get a fire option.

In the Ancient Ruins stage, kill the red face on the wall to get a lot of K blocks. Make sure you hit him in the eyes.

I haven't mastered the Swimming stage yet, but I know you have to watch for everything, even the little underwater plants. But don't worry, Karnov cannot drown.
Mike Ryan
Port Richey, FL

King's Quest III: When you're doing a spell and it tells you to recite a verse from the book, just press the RETURN key.
Jay Cochran
Rockville, MD

Leather Goddesses of Phobos: To get the blender, put the clothespin on your nose and lip balm on your lips. Close your eyes, cover your ears with your hands, and kiss the frog.

At the Southern Ice Cap, get the crying robot and wrap your blanket around it. Put it in the basket and leave it on the doorstep of the orphanage. They will take the robot inside and leave the door unlocked. Go inside and get the cotton balls.
Ken Ruchala
Valley Stream, NY

The Legend of Blacksilver: Here's how to get past the rockslide in the castle: Go to King Durek's castle and talk to the prince. When he says what his treasure is, search all the chests you can get at, using the small key to open doors to find more chests.

When you find the Blue Gem, make sure you have at least 100 gold pieces, then exit the castle. Go to the Owl Temple on the other side of Crescent Lake, talk to the priest at the altar, and make a donation that leaves you with 100 gold pieces.

The priest will ask if you want the Archives opened for 100 gold pieces; answer yes. Climb down the stairway that appears in the temple's center aisle, then walk around the archives until you find the Singing Crystal Exhibit. Use your Blue Gem to get the Singing Crystal. Exit the Archives, return to the Castle, and open the door to the Inner Sanctum. When you get to the rubble, just use the Singing Crystal.

Once you've cleared the landslide, the crystal will melt. Kill some Orcs to free the Wizard.
Marty Kucharuk
Jewett City, CT

The Mars Saga: When wandering around the planet's surface, you may encounter a group of Nomads who will give you a Finder. When you are southwest of the first city and the Finder doesn't blink for a long time, examine the area and you'll find the entrance to hidden caverns.
Frank Goodale
Westland, MI

Master Ninja: This chain of movements will beat any regular opponent. (The "irregulars" are the archer, fast shuriken star thrower, blowgun man, tiger and the evil priest). Get in close striking distance, but not near the border. Roll past your opponent, then use a backward kick on him. Repeat until he's dead.

Kill the tiger with a knife. Kill the blowgun men and archers with shurikens.

When you come to a fork in the road, go left.
Russ J. LeBar
Doniphan, MO

Neuromancer: When you first begin the game, sell all of your body parts. You can still live and play fine without them. Keep checking in at Gentleman Loser's Bar, since the girl is always told to give you things. The only way to know is to use Pax and read the bulletin board.
Phil Greco
Address Unknown

Night Mission Pinball: Go into Fix mode and select the Easy Multi-Ball option. Then when you start the game, pull the bumper all the way down then up one notch. When you release the ball it will go up and across and stay in the chute. Another ball will appear, and you can go again. You can have up to four balls.
Matt Sanderson
Pocatello, ID

Odin: On level four of this game downloaded from Q-Link, keep a close watch under yourself. The ships can appear from there.
Contributor Unknown

Ogre: For the best defense, buy all the GEV's you can get. Dart in and out, targeting the Ogre's main batteries and treads. As the Ogre slows down due to lack of treads, it won't have any weapons with sufficient range to hit your GEV's. You should be able to take it out before it gets to your command post. Sure, it can still use its missiles, but those are only one-shot weapons and so are not a high priority.
Michael Denman
Katy, TX

Pool of Radiance: Before leaving the city, make sure that you equip each character with at least four darts. As soon as you en-

ter combat, equip each character with his or her regular weapon (sword, mace, etc.). When you attack, you will get two or three attacks for the first melee round.

Don't be intimidated by large battles. Keep trying with different strategies, and eventually you will win.
Sam Stedman
Sudbury, Ontario
Canada

Pool of Radiance: For easy experience, get one good character and take him or her into the slums west of Phlan.

If you see a message about a room, search the room for gold or magical items.

For even greater experience, go to the Pyramid, third level, and search continuously. Alternatively, go to the Graveyard, where you can get 4000 experience from finding four scrolls with restoration on them. Be sure to have plenty of gold, since it costs 1000 gold to advance.
Michael Ratzlaff
Evergreen, CO

Questron I: When you start a new character, go right to Geraldtown and buy weapons first. Get all the food you can buy with the money left over. Bank the money you get after battles.

To find Mesron the wizard, go to the castle on the south of Questron. Go through the gate, then go east to the passage. Mesron's chamber is the first hall off the main passage.

Once Mesron advances to a squire, get the gold key on the west side of the castle. It is in the chest with the blue barrier around it. This key will open all the doors in the castle.

Next go to the King, who may advance you to a knight. Once he has done this, go to the southern part of the King's chamber and open the chest. Here you will find the trumpet, which is useful in dissipating fog.

To get more hit points (maximum 19,999), go to the cathedrals and give to the priests. Then go to the room with the cross in it and speak. One or more vials will appear. Hold and operate them.

Each cathedral is special. In Swamp Cathedral, you can raise your dexterity in the northeastern corner. In Island Cathedral, you can raise your intelligence in the eastern room. Ocean Cathedral gives you a magic flute.

In the first dungeon, you need to find the lead key. In the second, you need to find the diamond ring. In the third, you must destroy Mantor the Evil Wizard. It's a good idea to get as much of a magic assortment as you have money for.
Duane Penhallegon
Dexter, MI

Red Storm Rising: When you receive a mission to hunt subs, cruise missiles or ballistic missiles in the World War III scene, be careful to move the joystick at normal speed when approaching the area of enemy subs. If you travel at high speed, the enemy will immediately be alerted to your presence.

When you encounter a strike force of surface vessels, use torpedoes on the major warships, and do it while traveling at only five knots. Use the weapon control after your torpedoes are activated, steering them into the major warships first. After all, the smaller amphibious ships are slower, and you can take them out with a cruise missile or harpoon.

The bigger warships will immediately fire at you if you fire a harpoon at them, and they have a better chance of knocking down your missile.
Allen B. Thames
APO New York, NY

Rendezvous With Rama: There is a way to cross the sea with the Dragonfly. Just get at the top of the stairway, open the case, enter the dragonfly, and type Fly South. It's as easy as that.
Chris Phillips
Muncy, PA

S.D.I.: When you're out in your spaceship, try to keep all satellites repaired. Don't worry about the enemy ships.

To win the game, do these things in this order: (1) When defending against attacks, never let any Russian missiles hit land. (2) Save the KGB woman in her space station. (3) Destroy ALL enemy ships. (4) Try to keep all satellites repaired.

You cannot destroy all enemy ships until the woman is rescued, so save her before attacking ships to win the game.
Jason Daunheimer
Waterloo, Ontario
Canada

The Shard of Spring: Search well the Gatekeeper's Tavern, since it has one path that leads to a lost land, and eventually to Ralith's Tower.

When you're ready to enter Ralith's Tower, camp in front of the gate and check your spellcaster's spells. The spell Daza Reveli will appear. Cast it, and the gate will shatter!

Once inside the tower, be sure to kill Ralith before pursuing Siriadne. That's the only way to pass the invisible force-field.
Danilo Valmocena
Windsor, Ontario
Canada

Task Force: This is a multi-player online game found on many local bulletin board systems. When you first log on, you have immunity for six days, so leave only your mother ship and tankers in your fleet.

If you want to look around in the galaxy, split off a tanker and use it to move around. Although the documentation says that this has only a speed of two, when the tens digit becomes a two, you'll no longer use any moves or fuel. You can patrol the galaxy at will.
Robert Bogue
Bay City, MI

Temple of Apshai: Keep taking your character back to the Curse of Ra, level 3. Your intelligence, charisma and dexterity will increase when you get the right treasures.
Alex Antonio
Dallas, TX

Uninvited: Here are some of the answers you've been looking for! When you start the game, open the mailbox and take out the amulet. Put it in your inventory, then open the front doors. Go in, open the door in front of you, and go through it. Now, without opening any more doors, go up the stairs.

Enter the first door on your right, and get the No Ghost Spray. Put it in your inventory and go downstairs. Choose any door, open the No Ghost Spray, then open the door. Use the spray on the woman who comes out and watch her melt away.

Go to the kitchen, go right, and get the match box. Later, if

you encounter two dogs, say "Instantum Illuminaris Abraxas" to one of them, and they will both run away.

If you move the cross on the altar, a hidden doorway will appear. Down its passageway, a giant spider is waiting to eat you.

When you are in the maze, the amulet will frighten off a single zombie working alone. If you come across five of them together, you're entirely on your own.

Jason Daunheimer
Waterloo, Ontario
Canada

Victory Road: The super demons at the end of each board can be easily defeated, provided you have a flame thrower. Fire it while approaching the super demon in the middle, stopping your advance a few inches before you reach it. Keep firing, and when it retreats, move forward. When the demon dies (soon), move to the next level.

When crossing the tar pits, moving diagonally will allow you to move faster.

Eric Majeski
Burgettstown, PA

Wargame Construction Set: In the Observation phase of the one-player game, place the joystick in port 2 and press the fire button. All the enemy units will be revealed.

Pressing the F3 key during the game will remove all units from the map, showing the terrain features in detail. Pressing it again will resume play.

Ta-wei Wan
Bangkok, Thailand

128 Mode/Exploring the VDC

Continued from page 72

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

```
10 FOR T=Ø TO 2Ø4:READ A$
   :POKE 6144+T,DEC(A$):NEXT'IUKG
2Ø BSAVE"MOUSE8Ø.BIN",BØ,
   P6144 TO P635Ø'CPMF
3Ø REM INSTALL BY BLOADING"MOUSE8Ø.BI
   N"'BRGH
4Ø REM THEN SYS 6144'BLOD
5Ø END'BACB
6Ø DATA AD,15,Ø3,C9,18,FØ,19,Ø8,78,AD,
   14,Ø3,8D,FØ,18,AD'BWUM
7Ø DATA 15,Ø3,8D,F1,18,A9,21,8D,14,Ø3,
   A9,18,8D,15,Ø3,28'BWNM
8Ø DATA 6Ø,D8,AD,7E,11,DØ,33,AD,19,D4,
   AC,F2,18,2Ø,5D,18'BWTO
9Ø DATA 8C,F2,18,18,6D,D6,11,8D,D6,11,
   8A,69,ØØ,29,Ø1,4D'BWWP
1ØØ DATA E6,11,8D,E6,11,AD,1A,D4,AC,
    F3,18,2Ø,5D,18,8C,F3'BWOF
11Ø DATA 18,38,49,FF,6D,D7,11,8D,D7,
    11,4C,B2,18,8C,F5,18'BWUG
12Ø DATA 8D,F4,18,A2,ØØ,38,ED,F5,18,
    29,7F,C9,4Ø,BØ,Ø7,4A'BWEH
13Ø DATA FØ,12,AC,F4,18,6Ø,Ø9,CØ,C9,
    FF,FØ,Ø8,38,6A,A2,FF'BWUI
14Ø DATA AC,F4,18,6Ø,A9,ØØ,6Ø,ØØ,AD,
    E6,11,6A,AD,D6,11,6A'BWCJ
15Ø DATA AØ,FF,C8,38,E9,Ø3,C9,Ø3,BØ,
    F8,CØ,4F,9Ø,Ø2,AØ,4F'BWBK
16Ø DATA 18,AD,D7,11,69,19,4A,4A,4A,
    AA,18,2Ø,FØ,FF,4C,65'BWYL
17Ø DATA FA,EA,38,AD,19,D4,ED,FØ,ØC,
    C9,Ø2,9Ø,ØD,C9,FD,BØ'BWEM
18Ø DATA Ø9,AD,19,D4,8D,FØ,ØC,4C,88,
    18,4C,65,FA'BNDL
```

END

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